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THE ECONOMIC JOURNAL

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Edited by SIR ROY HARROD *and* E. A. G. ROBINSON
Assisted by R. C. O. MATTHEWS

I. ARTICLES

A Survey of Welfare Economics, 1939–1959	E. J. MISHAN	197
The Age of Economic Development	E. R. BLACK	266
Second Essay in Dynamic Theory	SIR ROY HARROD	277
The Social Anthropology of Economic Underdevelopment	J. L. SADIE	294
The Forward Pound 1951–59	B. READING	304
Real Balances, Expectations and Employment	K. K. KURIHARA	320
Marginal Productivity and Probability Distributions of Factor Services	A. A. WALTERS	325
Income Distribution in the Edgeworth Box Diagram	M. H. PESTON	331
A Model for the Study of Protected Oligopolies	S. STYKOLT and H. C. EASTMAN	336
The Withdrawal of Railway Services	M. HOWE and G. MILLS	348
International Reserves and Liquidity	T. BALOGH	357

II. REVIEWS (For a List of Books Reviewed see inside cover) 378

III. NOTES AND MEMORANDA

How Long is the Long Run?	H. B. MALMGREN	412
The "Economic Efficiency" of Taxation: A Note	A. [illegible]REST	415
The Share of Wages in National Income and the Terms of Trade: A Rejoinder	G. MAYNARD	419
Current Topics		420

IV. RECENT PERIODICALS AND NEW BOOKS 426

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REVIEWS

		PAGE
BACKMAN (J.). *Wage Determination*	By H. S. KIRKALDY	384
BAIN (J. S.). *Industrial Organisation*	By S. R. DENNISON	386
BEER (S.). *Cybernetics and Management*	By M. G. KENDALL	391
BRADLEY (P. D.) (Ed.). *The Public Stake in Union Power*	By D. T. JACK	381
BRENNAN (T.). *Reshaping a City*	By P. ROBSON	403
GUILLEBAUD (C. W.). *An Economic Survey of the Sisal Industry of Tanganyika*	By D. T. JACK	405
HINTON (R. W. K.). *The Eastland Trade and the Common Weal in the Seventeenth Century*	By N. C. HUNT	401
HORSEFIELD (J. K.). *British Monetary Experiments, 1650–1710*	By C. WILSON	396
HUGHES (T. J.) and LUARD (D. E. T.). *The Economic Development of Communist China, 1949–1958*	By J. ROBINSON	409
International Reserves and Liquidity	By T. BALOGH	357
IRVINE (A. G.). *The Balance of Payments of Rhodesia and Nyasaland, 1945–1954*	By P. DEANE	389
JOHNSON (L. G.). *The Social Evolution of Industrial Britain*	By E. J. HOBSBAWM	405
KLEIN (B. H.). *Germany's Economic Preparation for War*	By LORD DALTON	410
LAMARTINE YATES (P.). *Forty Years of Foreign Trade*	By A. MAIZELS	407
MARCH (J. G.) and SIMON (H. A.). *Organizations*	By P. SARGANT FLORENCE	393
PEN (J.). *The Wage Rate under Collective Bargaining*	By G. L. S. SHACKLE	378
RICH (E. E.). *The History of the Hudson's Bay Company, 1670–1870, Vol. I*	By W. T. EASTERBROOK	399
ROBERTS (B. C.). *National Wages Policy in War and Peace*	By T. C. COOPER	383
SAVAGE (C. I.). *An Economic History of Transport*	By T. C. BARKER	398
VICKERS (D.). *Studies in the Theory of Money, 1690–1776*	By SIR RALPH HAWTREY	394
WALD (H. P.). *Taxation of Agricultural Land in Underdeveloped Countries*	By A. R. PREST	389

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JUNE 1960

NOTE BY EDITORS

THE article which opens this issue is the first of a series of six Surveys of recent developments of economic theory which it is hoped to publish in the ECONOMIC JOURNAL at six-monthly intervals. This series, like the parallel series which is appearing in the *American Economic Review*, is supported by a grant from the Rockefeller Foundation. The Editors wish to acknowledge the initiative and encouragement of the late Professor Norman Buchanan, then Director for the Social Sciences at the Rockefeller Foundation, in suggesting and developing the plans for these Surveys. The subsequent Surveys will include " Linear Theory and Activity Analysis," by J. R. Hicks; " Interest Theory," by G. L. S. Shackle; " Theories of International Trade Policy," by Sir Donald MacDougall; " Theory of Oligopoly," by C. F. Carter. The scope of the last article in the series has not yet been finally determined.

A SURVEY OF WELFARE ECONOMICS, 1939–59[1]

I. INTRODUCTION

WHILE it continues to fascinate many, welfare economics does not appear at any time to have wholly engaged the labours of any one economist. It is a subject which, apparently, one dabbles in for a while, leaves and, perhaps, returns to later in response to a troubled conscience—which goes some way to explain why, more than other branches of economics, it suffers from an unevenness in its development, a lack of homogeneity in its treatment and, until very recently, a distressing disconnectedness between its parts.[2]

A survey of the literature, therefore, which sought to do no more than elucidate in rough chronological order the ideas of the chief writers, while it might whet the appetite of some, would almost certainly leave the mind of the general reader in a dazed and dissatisfied condition. An alternative

[1] I wish to acknowledge, with gratitude, the services of Dr. S. A. Ozga, who gave freely of his time in discussing a first draft with me. The paper has benefited greatly from his many suggestions and criticisms. I am indebted also to Mr. Klappholz for some useful criticism on my excursion into methodology, and to Mrs. Diana Oldershaw for thoroughness and care in the cheerless task of compiling a bibliography.

[2] Little's *Critique*, in my opinion, has gone far to remedy this particular defect.

procedure, and that adopted here, is the bolder one of occasionally tightening up loose connections and, especially in the later sections, suggesting, if not adopting, a particular perspective. While such a method imparts a more coherent picture than could possibly emerge from a non-committal account of the principal ideas, some degree of personal predilection is obviously unavoidable. It is a matter of prudence that the reader at all times bear this in mind.

On the question of coverage, since welfare economics is here understood as analysis—theoretical welfare economics, as it is sometimes called—and not the application of welfare propositions to economic situations, everything in the larger literature on economic policy has been disregarded. Index numbers, as indicators of welfare changes, are given only footnote treatment, since in all essentials the problems associated with them are the same as those uncovered in the controversy over hypothetical compensation, a matter discussed at some length in Part III. Excluded also is the controversial field of socialist economics except in so far as theoretical innovations are thrown up by the disputants. Again, the accent being on the formal development of welfare economics, the non-static aspects inevitably receive less attention.[1] Thus, until Part V, the framework of our exposition remains a static one. No growth or innovation takes place, no uncertainty exists and individual tastes remain unaltered. In addition, the working population is fixed and is, in some sense, fully employed. Within this framework it is further assumed that individual behaviour is consistent, and—unless otherwise proposed—that the individual is the best judge of his own wants.

To avoid tedious qualification at every stage of the analysis, we shall assume henceforth, unless otherwise indicated, that each individual consumes some of each of the goods and supplies some of each of the factors in the economy; that all goods and factors are sufficiently divisible to warrant the concept of marginal adjustment; that each class of goods or factors is a homogeneous group, any unit in that group being a perfect substitute for any other; and, lastly, that all relevant functions are differentiable and have sufficient curvature to yield tangency solutions.[2] Nothing unexpected or fundamental emerges from the removal of any of these simplifications, with the exception of divisibility. The consequence of removing this simplification is, however, dealt with in Part IV and an occasional footnote. Finally,

[1] A great deal of welfare economics, in the broader meaning of the term, is spoken by the elder-statesman type of economist, and much of it rings wise and true. But while it warns us, rightly, of the limitations of our analysis, it does not contribute directly to the formal development of the subject. Some of these broader considerations, however, are touched upon in the final section.

[2] If the functions are not differentiable we get kinks and corner solutions. If they have insufficient curvature we have corner solutions in the choice of output possibilities, and boundary optima in exchange situations. In such cases, though the optimal solution in terms of outputs is unambiguous, relative prices may be indeterminate within a wide range. Treatment of these things is popular in the literature on linear programming.

in order to purge the text of continual amplification, illustration and comment, which would otherwise impede the flow of the argument, footnotes have been freely resorted to. The general reader is advised to omit them on a first reading.

Since we have affirmed that the subject matter of this survey is theoretical welfare economics, we may begin by hazarding a definition of the term. Theoretical welfare economics is, then, that branch of study which endeavours to formulate propositions by which we may rank, on the scale of better or worse, alternative economic situations open to society. The words "better" and "worse" obviously call for clarification, and to this end we first consider the situation of the individual. His indifference map may be regarded as a picture of his chosen ranking of the conceivable combinations of goods and services. If we say that when he moves to a higher indifference curve (or that when he expands the effective area of his choice [1]) he is better off, or he increases his welfare, we are giving expression to an ethical judgment; namely (*a*) that the individual—and no one else—is the best judge of his own well-being. In the Crusoe economy no more than this is required for welfare economics. But it is required. Without it, we may remark that Crusoe moves to a higher indifference curve, but we are then only describing how Crusoe acts: we are not judging his welfare. We can agree that under the utility hypothesis the individual believes himself to be better off in choosing a goods combination II rather than I. But since it is we, as welfare economists, who are to decide how to rank the alternatives facing him, unless we are agreed to accept his own ranking as final his preference field is irrelevant as an index of his welfare.

Since welfare economics is, however, concerned chiefly with community welfare, we shall require additional ethical judgments. The most widely accepted of these is (*b*) that the welfare of the community depends on the welfares of the individuals comprising it, and on nothing else. The mathematical expression of this statement is, of course, Bergson's social-welfare function in its general form, discussed in Part II. We can make this function a little more specific by attributing to it an ethical property which, it is believed, most people will accept—(*c*) that if at least one person is better off, no one being worse off, the community as a whole is better off.[2]

Turning to the more likely case, in which changes in economic organisation make some people better off and others worse off, several avenues are

[1] An interesting suggestion for a welfare economics in terms of expanded choice rather than indifference curves has been made by Lancaster [142]. Though it transpired that the definitions he adopted were not consistent * (see [183], [64] and [191]), it should not be hard to think of some consistent set of definitions which would enable us to determine changes in welfare by reference only to budget data, like index numbers. However, one cannot envisage any great advantage for welfare economics from this innovation.

* Since the above note was written, Lancaster has submitted a new set of definitions and a general proof in the Economic Journal, December 1959.

[2] In such cases Graaff [84] would say that the social-welfare function was of the "Paretian type."

open to us: (d_1) we can defer final judgment on the alternative patterns of welfare open to the community until we have completely specified the social-welfare function—that is, until we have ranked all possible combinations of individual welfares—which, in practice, means that we shall defer it indefinitely; [1] (d_2) we can exercise our judgment about resulting welfare distributions whenever we have to rank alternative situations. And, we may go further, and indicate the guiding aim of our policy on distribution, such as to equalise real incomes in some sense. Finally, (d_3) we might try to evade this judgment on welfare distribution by the conservative principle of compensated adjustment. We must suppose, as in (d_1), that any degree of welfare redistribution is feasible, and, on this principle, redistribute in order that no one is left worse off, though some are better off, in effect meeting the criterion (c) above.

There remains the question of methodology, which is touched upon only in the slightest manner in the formal treatment of this subject.[2] The question to be answered is whether welfare propositions, like positive propositions in economics, are capable of being tested. In the latter we postulate a set of propositions, or axioms, A, and test the implications, B. In effect, hypotheses about welfare can be cast into the form, if W then R; by which we mean that if we accept certain assumptions about the nature of the economic universe, and if we accept some particular definition of an improvement in social welfare, then we can draw an inference R—namely, that when certain conditions are met social welfare is increased. This inference, R, a welfare proposition, can, conceptually, at least, be subjected to a test, inasmuch as we can inquire of each person whether or not he is better off, or else compare the ranges of goods available to him in two alternative situations.

Formally, then, propositions in welfare economics may be subjected to tests in the same way as those of positive economics. But there are far greater difficulties involved in testing an implication " fulfilling these conditions will make everyone better off " than in testing, say, the implication " if the price rises he will consume less." Generally, in positive economics any of the implications we seek to observe are simpler than direct tests of the set of axioms from which it is deduced—if these axioms can be tested at all. In

[1] It may be noted in passing that the view that a prior mapping of a boundary encompassing all possible welfare combinations open to the community may proceed without ethical presuppositions reckons without ethical judgments (a) and (b) above.

[2] An exception to this opinion is a recent and highly stimulating paper by G. C. Archibald [6], to which I am extremely indebted. It is difficult, however, to accept his suggestion that welfare economics can be studied without committing ourselves to welfare judgments by the simple expedient of sewing them on to a definition of welfare. This, of course, is possible, but no worthwhile advantage seems to follow from this ruse. The definition, he concedes, if it is to wear, must be " interesting." But an " interesting " definition, in the context of welfare, is surely one that has broad ethical appeal. A definition which embodies no acceptable ethical proposition and yet is interesting to someone, is interesting only as a weird exercise. In order to decide whether a definition of an improvement in social welfare is to be adopted as the base on which to erect welfare propositions, we are impelled to ponder on its ethical implications.

welfare economics, however, if anything it seems the other way about: a test of the implications is more difficult than a direct test of the assumptions. Indeed, so remote is the likelihood of testing welfare implications that one is tempted to relinquish the orthodox methodology and have recourse to an admittedly inferior method—some might say an inadmissible method—of attempting to ascertain the validity of the premisses, *W*. After all, if (*a*) the assumptions about consistency and the shapes of the technological and behaviour functions are correct, and (*b*) if no other considerations are relevant, then good logic ensures that the implication, *R*, follows—that if the rules deduced are met, welfare, as defined, is increased.

Both these are, of course, very big ifs. In regard to (*b*), since our attention may be drawn to additional considerations as the subject progresses, we can never be sure we have not overlooked some factor which bears on the individual's welfare. As for (*a*), some of the assumptions have so far entered into positive theorising that their undeniable usefulness as assumptions has come to be associated with a belief in their validity. We may decide, after all, that people are in fact sufficiently consistent, and that tastes are sufficiently constant for the period in question, to make little difference to the result. As for the others: the nature of the production functions involved, the relationship between income distribution and relative prices, the interdependence of individual welfares, may gradually yield to patient investigation, so that any assumption about these things can be more than mere guesses. But it is a slow business. In the meantime, the practice has been to allow for our ignorance about such functional relations by requiring that our welfare propositions hold for all conceivable properties of such functions—a procedure which is, perhaps, too severe a test of the applicability of welfare propositions, and is, apparently, in large measure responsible for the indiscriminating pessimism now in vogue,[1] a matter which will receive further attention in the final part of this survey.

The above remarks are to be understood as an attempt to explicate the kind of methodology which appears consistent with the writings of the better-known economists, and to elaborate the sense of the frequent statement that welfare propositions rest on both factual and ethical assumptions. Unless both are granted, the first as being " realistic," the second as being " widely acceptable," the welfare propositions deduced from them are of no practical importance.

II. The Optimum Conditions

Looking back over the last two decades at developments in welfare economics, the names that most readily spring to mind are those of Bergson, Kaldor, Hicks, Scitovsky, Samuelson, Little, Arrow and Graaff. The

[1] The word to be underlined here is *indiscriminate*. There may well be grounds for pessimism concerning the scope for applications of welfare economics, but, as is contended in the final section, most of the pessimism generated is for the wrong reasons.

temptation is to plunge at once into a discussion of the welfare criteria proposed by Kaldor, Hicks, Scitovsky and others, and of the social-welfare function introduced by Bergson, and later explored by Arrow and others, for these are the things which excited the most controversy at the time and still pique the curiosity by their elusiveness. For the purpose of exposition, however, this temptation is to be resisted. During the period in which these welfare criteria were being subjected to close scrutiny, treatment of the optimum conditions was one of the staple materials in text-books on welfare economics, and examples of their application continued to pour into the journals. A survey of this more pedestrian activity, which can usefully be regarded as a search for the necessary conditions of a position of maximum social welfare, is logically anterior in that the range of welfare possibilities open to society should be unfolded prior to the engagement of an apparatus of social choice involving ethical judgments. The next few pages, therefore, will be taken up with the examination of the optimum conditions of social welfare, leaving social-welfare functions and welfare criteria (which may be thought of as properties of a social welfare function) to be dealt with in Part III.

The Thirties

Although several noteworthy contributions appeared in the thirties, no common mode of treatment emerged. For one thing, while the welfare import of a Crusoe economy seemed plain enough, the significance for the community as a whole of meeting the so-called optimum conditions was not always clearly understood. For another, there was a variety of ways in which an optimum position might be expressed and discrepancies as to the proper number of conditions necessary to identify it. A comparison in these respects of the various contributions, in order of appearance, would be a fascinating if exhausting game. The intellectual reward, however, would be slight. We therefore omit in the text further reference to the pre-1939 literature on this aspect [1] except for a few paragraphs on Pigou and Bergson,

[1] The somewhat disconnected nature of earlier developments in this field can be illustrated by outlining some of the principal features of three well-known contributions in the thirties; in chronological order, Lerner, Kahn and Hotelling.

In his article on monopoly (A. P. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," *Review of Economic Studies*, 1934), Lerner adopts as a definition of optimum a situation in which no individual can improve his welfare without making another worse off. It is met when the rates of substitution between pairs of goods for all individuals are equal to the technical rate of substitution. According to Lerner, this translates into the condition that product price ratios be proportional to marginal displacement costs, which condition is satisfied if price equals marginal cost. Any divergence between price and marginal cost is a measure of loss entailed by monopoly power.

In his later paper on Socialism ("Economic Theory and Socialist Economy," *Review of Economic Studies*, 1934), without saying more about optimum, he introduces the condition that all factors have the same ratio of marginal physical products, failing which a net increase of output is possible. Though Kahn (R. F. Kahn, "Some Notes on Ideal Output," ECONOMIC JOURNAL, 1935) objects to Lerner's calling this condition an objective test on the grounds that it may be fulfilled while at the same time the "wrong" amounts of goods are produced, a re-reading of Lerner reveals that

a brief appraisal of the main features of whose work provides the necessary background to the developments in the period that concerns us.

The standard work of reference in the inter-war period was, of course, Pigou's *Economics of Welfare*.[1] In scope, in erudition, in systematic and lucid exposition, the work is a classic which no interested student can read without pleasure and, indeed, without occasional wonder. Mention of issues which are at the hub of current controversy may be discovered ensconced in the middle of an innocent-looking paragraph or tucked away modestly in some passing footnote. Aware of the obstacles to any generalisation in this field, Pigou moves cautiously. Only welfare which can be brought into relationship with the measuring rod of money falls within his province. For the most part he declines the services of the partial consumers' surplus technique

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its objectivity consists in its being recognisable by a government bureaucrat producing goods in accordance with some arbitrary scale of values. Significantly, Lerner adds that a pricing system eliminates not only this source of waste but also that from producing the " wrong " goods when measured against people's demands, the latter source of waste being the more important.

Since the apparent purpose of Kahn's paper on ideal output was to put a sharper edge on some of the Pigovian tools, he adopted Pigou's welfare objective of maximising the national dividend. To do this without reference to distribution is, according to Kahn, to suppose we are maximising the satisfaction which would obtain if differences in the marginal utility of money to different people did not exist. So as not to become involved in distributional problems he assumes this to be the case, and is able, therefore, to take the price of a commodity, or factor, as denoting its marginal utility, or disutility, respectively, for the community. These latter assumptions, it may be observed in passing, are not those adopted by Pigou in his *Economics of Welfare*.

Kahn's paper is remembered chiefly for its amendment of two corollaries of the Pigovian system. First, whereas Pigou would have expanded industries with external economies and contracted those with external diseconomies in the belief that these effects were the exception rather than the rule, Kahn proposed that, in the event of such effects being common, the rule should be such as to shift resources from industries whose external economies were below the average to those industries where they were above the average. Second, and more of a departure from tradition, in the absence of external effects, the industries to expand are those whose ratios of price to marginal cost are above the average, and the industries to contract are those whose ratios are below the average. Ideal output requires no more than an equal degree of monopoly in all sectors of the economy. Criticism of this latter proposition seems to have ignored his " provisional " assumption that all factors were perfectly inelastic in supply.

Hotelling's famous paper (H. Hotelling, " The General Welfare in Relation to the Problems of Taxation and of Railway and Utility Rates," *Econometrica*, 1938) was one of the first attempts to vindicate the partial welfare approach of consumers' and producers' surplus in the light of a general welfare analysis. His fundamental theorem attempted to demonstrate than any excise tax which replaced an income tax yielding the same revenue placed the individual in a less-preferred position. A bridge, or other public utility, in which price was set above marginal cost (in order that total receipts cover total costs in decreasing-cost projects) was an example of an excise tax on a product or service in contrast to the alternative of raising the requisite revenue by an income tax, leaving price to equal marginal cost in the public utility.

A rather different argument is used later in the paper to uphold the consumers' surplus notion, which anticipates by a few months the Kaldor formula: if, in introducing an investment, some distribution of the burden is possible such that everyone concerned is better off than without it, there is a *prima facie* case for introducing it. This, he admits, leaves aside the question of whether the necessary distribution is practical. Provided, however, the benefits are great and widespread, it should be introduced even if some are actually made worse off. Extreme hardship, however, would warrant compensation.

[1] A. C. Pigou, *The Economics of Welfare*, 4th Edition (London, 1932).

initially favoured by Marshall, preferring a more general approach, and adopts a dual criterion for the detection of improvements in social welfare: an increase in the national dividend without any increase in the supply of factors, and a transfer of wealth from rich to poor. In regard to the first, while there are insuperable difficulties in measuring the national dividend as a total figure, an increase in its value—brought about either by increasing some goods without diminishing others or by transferring factors to activities in which their social value is higher—is deemed an improvement in welfare provided that the share of the poor is not thereby reduced. As for the second, any reorganisation of the economy which increases the share of the poor without injuring the national dividend is to be accepted as a gain in social welfare. Any other consequence of economic reorganisation is ambiguous.

In order that output be truly ideal we must measure in terms of social, and not private, value; hence, his clear distinction between (i) the value of the marginal *private* net product, which is no more than the marginal physical product of the factor, as appropriated by the producer, times the market price of that product, and (ii) the value of the marginal *social* net product, which is the total of the products and services arising from the employment of the additional factor, no matter to whom they may accrue, each product or service being multiplied by the relevant market price. A large part of the book is devoted to pointing up situations in which (i) and (ii) diverge. In the event that (ii) exceeds (i) in any industry, that industry is to be expanded. If the reverse is true, the industry is to be contracted.

The Economics of Welfare is frequently associated with the controversies of the thirties over interpersonal comparisons of utility. But its enduring contribution is to be found in the continued emphasis on the vital distinction between social and private valuations of economic activities, a distinction evoked nowadays more by reference to "external effects" or "external economies and diseconomies of production and consumption."

Though Bergson's seminal paper appeared in 1938,[1] his influence on several of the later writers was marked. In particular, Lange, Samuelson, Arrow and Graaff[2] drew inspiration from his approach and technique. The approach used was the time-honoured one of constructing a more general model under which the contributions of the previous writers could conveniently be grouped. In essence, social welfare was to be thought of as some function of the goods bought, and the factors supplied, by each of the individuals in the community plus, for completeness, any other relevant variables. Without giving it any specific form, this social-welfare function can be maximised subject to the constraints of the production functions. Of the variety of expressions which can be concocted of the first-order conditions

[1] A. Bergson, "A Reformulation of Certain Aspects of Welfare Economics," *Quarterly Journal of Economics*, 1938.

[2] See bibliography, items 144, 222, 14 and 24.

for this maximum, Bergson selects four which lend themselves to the following interpretation:

(1) The marginal social welfare "per dollar" of each commodity be the same for all individuals.

(2) The marginal social diswelfare "per dollar" of each kind of work be the same for all individuals.

(3) The marginal-value productivity of each type of labour be equal to the wage of that type of labour.

(4) The increment in value from shifting a marginal unit of any non-labour factor from a good X to a good Y be equal to the costs involved in this shift. This condition is more familiar in the special case in which the costs of shifting the factor are nil. The condition then requires that the value of the marginal product be the same in all uses.[1]

Conditions (1) and (2) are but formal corollaries of a maximum welfare position for society: in the jargon, they have no more "operational significance" than the equal marginal utilities per penny at which the "discerning" consumer aims. If by unanimous consent the distribution of the work and of the product are ideal, these two conditions are deemed to be fulfilled: no other test is possible.

Bergson's method had the virtue of recognising that the latter two conditions containing the rules for ideal output were separable from any prepossessions about the distribution of welfare which would be reflected in the first two conditions, an inference which was in contradistinction to the impressions conveyed by certain of the Cambridge writers, that they could be accepted only in conjunction with a particular distribution of welfare, equality.[2]

Development after 1939

Though continually displayed at slightly different angles by the various writers, the optimum conditions after 1939 began to look distinctly shopworn. A chronological reading imparts more of a sense of repetition than of evolution. Our purpose will be served with least tedium if, therefore, we proceed at once to an exposition of the logic of the optimum as it appears to-day, illustrating in footnotes the practice of some of the chief writers.

[1] As may be gathered from a further reading of the text, condition (3) may be viewed as a special case of a more general interpretation of condition (4), extended: (*a*) to cover all factors and not merely nonhuman ones, and to apply to all occupations including leisure, and (*b*) to include, in the differences in welfare referred to, the preferences of resource-owners as between occupations in addition to external economies and diseconomies.

[2] On the other hand, Bergson states that only the Cambridge School (which he associates with Marshall, Edgeworth,* Pigou and Kahn) have a clear-cut social-welfare function. If social welfare is the sum of the individual utilities, diminishing marginal utility implies that the maximum social welfare is consistent only with equality of the marginal utility of money income among all individuals. If all have equal capacity for enjoyment, this first-order condition for a maximum is fulfilled when all incomes are the same. * See note on p. 265 below.

In their various formulations all of the optimum conditions are derivable from what is commonly called a Pareto optimum,[1] defined as a position from which it is not possible, by any reallocation of factors, to make anyone better off without making at least one person worse off (or, more briefly henceforth; to make "everyone" better off[2]). Since, at this level of abstraction, no institutional restrictions are placed on the degree of factor movement, large or small, a true summit position is implied. In general, there are many such summit positions, each characterised by a different distribution of welfare.[3] Only a particular form of the social-welfare function enables us to select among all summit positions that yielding the highest social welfare. The Cambridge concept of ideal output, or ideal allocation of factors, a position from which no reshuffling of factors can add to the social value of the total product, expresses essentially the same idea as a summit or Paretian optimum position.[4] However, its attainment is contingent upon the fulfilment of a single rule, which we shall designate the *allocative rule*, requiring that the value, at the margin, of any class of factor be the same in all occupations in which it is used.

In consequence, as we should expect, the allocative rule is equivalent to any one of the alternative statements of the optimum conditions. Ignoring for the present the distinction between private and social valuation, and assuming for the moment, as does Pigou, that factor supplies are perfectly inelastic, we can decompose the allocative rule into three popular optimum conditions.[5] (1) *The Exchange optimum*, which requires that for each individual, the rate of substitution be the same for all pairs of goods in the economy.[6] It is simple to demonstrate with the aid of the familiar box

[1] See V. Pareto, *Cours d'Economie Politique*, Vol. II (Lausanne, 1897), pp. 90 ff., and also E. Barone, "The Ministry of Production in the Collectivist State," in *Collectivist Economic Planning*, edited by F. A. von Hayek (London, 1935).

[2] When used as an abbreviation of the relevant expression, "everyone" will be placed in quotation marks, otherwise it carries its normal meaning. If the goods were sufficiently divisible, then a situation in which at least one could be better off and no one worse off would also be a situation in which, literally, everyone could be made better off.

[3] To choose as between such positions we must therefore be prepared to make ethical judgments.

[4] Lerner's "Rule" for the Controlled Economy [148, Chapter 16]—six conditions linked by equality signs—amounts to the Pigou condition that the value of the marginal social net product be the same in all uses *plus* those conditions under which, in a decentralised economy, firms will in fact realise the Pigou conditions, assuming a coincidence of private and social net products.

Though tested in the increasing complexity of successive chapters, the Rule emerges triumphant. Even indivisibilities leave it unscathed, provided that the value of the product of the indivisible block of factors be estimated with reference to the area under the relevant demand curve—this area representing approximately the revenue of a perfectly discriminating monopolist.

[5] These three do not give the most compact form of the optimum conditions. As we shall see later, the first could be easily made part of the third. But in this limited form they appear frequently in welfare analysis, and will generally suffice when the results of the analysis in question are negative.

[6] The reader is reminded of our simplification: that all goods be highly divisible; that each individual buys some of all the goods; that all factors enter into each of the goods—unless modified in the text.

diagram [1] that no movement from a tangency position can make both individuals better off. (2) *The Production optimum*, which requires that for each product the rate of substitution between any pair of factors be the same.[2] Once this condition is fulfilled, it is not possible to produce any more of a good without producing less of some other good (for brevity, henceforth; to produce more of "every" good). (3) Building on these two "lower level" optima, each of which is a locus of "efficient points," is the *Top Level optimum*.[3] It requires that the subjective rate of substitution, common to all individuals, be equal to the rate of transformation (or, rate of objective substitution) for all pairs of goods in the economy.[4] Once top-level optimum is achieved, it is not possible to describe a higher level of welfare for "everyone" given the production possibilities of the existing supply of factors.[5]

[1] The lengths of the two axes measure the given quantities of the two goods to be divided between the two individuals, the origins of whose indifference maps lie in opposite corners. The locus of mutual tangencies is commonly referred to as the contract curve, after Edgeworth.

[2] The geometric representation is similar to that of the exchange optimum, except that the amounts of the factors are measured along the two axes, and that in principle the iso-product curves may be numbered. The locus of mutual tangencies is frequently referred to as the locus of efficient points, or, sometimes, as the production contract curve.

[3] Myint [189, Chapter 8] talks of (i) the subjective optimum, (ii) the physical optimum, and (iii) the general optimum of production and exchange, respectively.

[4] The standard diagram here is of the transformation curve, or production possibility curve, between two goods being tangent at some point to a community indifference curve. The data necessary to the transformation curve are taken directly from the locus of efficient points in the iso-product diagram. The concept of the community indifference curve will be discussed later.

[5] To show that these three conditions can be derived from the allocative rule, express the equality of the value of the marginal product in all lines of output as

$$p_x \frac{\partial X}{\partial A} = p_y \frac{\partial Y}{\partial A} = \ldots \qquad (a)$$

$$p_x \frac{\partial X}{\partial B} = p_y \frac{\partial Y}{\partial B} = \ldots \qquad (b)$$

where X and Y are products, A and B are factor units, p_x, p_y, are prices of the products X and Y, $\frac{\partial X}{\partial A}$ is the marginal physical product of factor A in the production of X, and so on.

Then: (1) Exchange optimum follows from there being but a single set of product prices facing each individual. Without this provision, the *value* of the marginal product would be ambiguous. (2) The production optimum follows from dividing (a) by (b) to give $\frac{\partial B}{\partial A}$ in X equal to $\frac{\partial B}{\partial A}$ in Y. (3) Top-level optimum follows if we divide (a) through by p_y and $\frac{\partial X}{\partial A}$, and (b) through by p_y and $\frac{\partial X}{\partial B}$ to obtain

$$\frac{p_x}{p_y} = \left[\frac{\frac{\partial Y}{\partial A}}{\frac{\partial X}{\partial A}} = \frac{\frac{\partial Y}{\partial B}}{\frac{\partial X}{\partial B}} = \ldots\right] = \frac{\partial Y}{\partial X}$$

p_x/p_y faces each individual, so that to each the rate of substitution is $\partial Y/\partial X$, and this is equal to the rate of transformation $\partial Y/\partial X$ (on the right-hand side of the equation) between the products, using any of the factors at the margin.

(It may be observed that this last equation reveals, in brackets, that the ratio of the marginal physical products for all pairs of goods is the same for each of the factors—an alternative statement of the production optimum.)

It is commonly alleged that a sufficient condition for the allocative rule, and therefore for the optimum conditions also, is that in all markets the price of the product is equal to its marginal cost. For multiplying each side of the equality by the marginal physical product of any of the factors yields the equality between the value of the marginal product and the factor price. And since—granted factor markets competitive and, provisionally, ignoring non-pecuniary considerations—the price of any class of factor is the same everywhere, so also is the value of the marginal product.

But is this condition *necessary* to the allocative rule? According to Kahn,[1] the rule is not violated if product prices are not equal to their corresponding marginal costs, provided that they are proportional to them. This "proportionality" thesis, however, requires not only a zero elasticity of all factor supplies, explicitly assumed by Kahn, but also that no good be both a final product and an intermediate good.[2]

If we now remove the assumption of a zero elasticity in the supply of factors, a summit position is not consistent with the proportionality thesis. If, for instance, product prices everywhere exceed their corresponding marginal costs by a given proportion, the value of the marginal product of each factor exceeds its supply price by the same proportion, granted the above proviso about intermediate goods. Factor owners may benefit by extending their supplies at prices less than the values of their corresponding marginal products, while consumers may gain from lower prices on additional purchases of the various products. The allocative rule should therefore be interpreted to include non-pecuniary activities, in particular leisure, among the alternative occupations open, without constraint, to the factor owner. Put otherwise, to the set of optimum conditions mentioned above, we must add a lower-level optimum condition requiring that the rate of transformation between factor and product be the same as the subjective rate of substitution between factor and product for every individual. We shall refer to this condition briefly as the factor-product condition.

What about occupational preference? If occupations X and Y pay the same rate but the individual prefers Y, he will place more of his factors there. In the limiting case he places all of his factors in Y. He may do this—though others may not—even though X pays a higher rate than Y, and, therefore, the market value of his marginal factor is higher in X than in Y.

[1] R. F. Kahn, "Some Notes on Ideal Output."

[2] In this connection, Little [161, p. 163] gives the following example. Coal, though a finished good, is priced as an intermediate good at its marginal cost. Electricity is priced as a finished good above its marginal cost. The rate of substitution of these two goods is therefore not equal to their rate of transformation. What this seems to show, however, is that, since the prices of all finished goods are required to be a given proportion of the value added at the margin by any (or, in the long run, all) of the factors, if an intermediate good is used as a finished good, in its latter use the price should be the appropriate proportion of its marginal cost, whereas when sold as an intermediate good its price should be set equal to its marginal cost. Whether it is possible always to maintain two different prices for the one product is a different matter.

But if the individual voluntarily forgoes extra payments in X, it is obviously because the loss in market value he sustains by reason of his choice is, at least, made up by the value that the individual places on his preference for Y (the words *at least* are inserted to allow for the individual who has placed none of his factors in X and whose premium for Y exceeds the current difference in pay between X and Y). The allocative rule should, in consequence, be amended to require that factors be so allocated that, to each individual factor owner, the value of any remaining preference of Y over X is equal, at least, to the additional market value of his marginal factor in X. An alternative statement is that a Pareto optimum has not been achieved if a worker can improve his welfare by moving to a lower-paid occupation. These opportunities for individual betterment are, however, exhausted by the factor-product condition mentioned above. For, given the rates of transformation between factor and product in the two occupations, a worker who prefers occupation Y to X will place more of his factors in Y than one who does not, in the limiting case placing none of his factors in X.

In passing, it may be mentioned that another, more compact, scheme of optimum conditions can be adopted which encompasses the formulations of several well-known writers. Summarised in a single rule that the rate of substitution between each pair of goods—goods to include, now, both products and factors—for every individual be equal to their corresponding rate of transformation, this statement comprehends six conditions: (1) that the rates of substitution be equal for all individuals as between (*a*) pairs of products, (*b*) pairs of factors and (*c*) any product and any factor; and (2) that the common rate of substitution be equal to the technical rate of transformation in each of the pairs (*a*), (*b*) and (*c*).[1] It may be observed, first, that in fact (1) is implied by (2), for if each individual equates his rate

[1] These conditions can be summarised in the following example of an optimum position, where A and B are different factors, and X, Y and Z their marginal physical products in three alternative uses.

	X	Y	Z	.	.
A	1	5	8	.	.
B	2	10	16	.	.
.	.	.	.	.	.

Since each of these figures is a marginal physical product, or rate of transformation of factor into product, if we assume that, through prices, each individual equates his rate of substitution to each of these figures, then we fulfil (*c*) for (2), and therefore also for (1). Reading horizontally, we see that, at the margin, a unit of factor A can be transformed into 1 unit of X, 5 of Y or 8 of Z. This ratio of 1 : 5 : 8 is true also for the second line, and represents the product rate of transformation (using any of the factors at the margin) to which the individuals must equate their rates of substitution, thus fulfilling (*a*) for both (2) and (1). Finally, if we glance down the columns we remark that the rate of technical substitution of A for B is 2 : 1 in each of the products X, Y, Z. If each individual equates his factor rate of substitution to this technical rate of transformation between factors, (*b*) is fulfilled for both (2) and (1). Obviously, in such a table, for any number of rows and columns the ratios, row-wise, are all the same, which give another ratio which holds for all of the columns. A failure at any point in these ratios indicates a failure at some point in the optimum conditions.

of substitution to the rate of transformation a common rate of substitution as between the individuals emerges for each pair of goods. Second, that inter-temporal substitution can be allowed for in (1) and (2) by regarding products and factors at different dates as different goods. Something like the conditions in this form will be found in Hicks [1] and in Chapter 8 of Little's *Critique*.[2]

Having amended our allocative rule to take account of factor-product adjustment and occupational preference or, alternatively, having completed one or other scheme of optimum conditions, we must recognise, first, that perfect competition is neither a necessary nor a sufficient condition for meeting the allocative rule, or the optimum conditions, even under the provisional assumption of coincidence of private and social valuation.[3] It is not necessary, since, without perfect competition, the allocative rule could be employed to guide the controlled economy into equating prices to marginal costs. It is not sufficient [4] simply because a situation in which price equals marginal costs in all lines—a corollary of perfectly discriminating monopoly as well as of perfect competition—does not necessarily entail proper adjustment to the factor-product condition. True, all factors are paid the full value of their marginal product, but—to introduce an inevitable indivisibility at this stage—since universal perfect competition is consistent with fixed hours of work in production,[5] each worker is subjected to a constraint which, in general, prevents his adjusting the supply of his labour to

[1] See bibliography, item 96.

[2] See bibliography, item 161. Dealing with the inter-temporal conditions, Little mentions the condition that the rate of substitution over time between goods be the same for each individual and equal to the rate of transformation over time. This is treated as one condition, not two. For the rest he ignores transformation and substitution as between factors themselves, and as between factors and products; instead he has two conditions requiring a common rate of substitution as between goods and money and as between bonds (or shares) and money.

In a simple riskless economy one would suppose Fisher's concept of the rate of interest which equates the marginal time preference of all individuals with the rate of return over cost would satisfy the inter-temporal requirements of an optimum position. We shall, however, touch on this point again in Part V.

[3] Despite continued allegations to the contrary. For recent examples see Dorfman, Samuelson and Solow [59, p. 410], and Henderson and Quandt [92, p. 211].

[4] In industries subject to decreasing returns to scale, owing to some scarce factor being unpriced and left out of the firm's production functions, marginal cost to the industry exceeds the inclusive average cost to the firms (since, in these circumstances, average costs do not include rent payments to this scarce factor). In perfect competition firms would then expand output to the point where the marginal cost to the industry exceeded the price of the product, the latter being equalled by the average costs of firms (excluding, of course, rent to the unpriced factor). A common example of such a case is deep-sea fishing. If someone appropriated the fishing area and charged a rent, based on the catch, so as to maximise his receipts (given the price of fish), perfect competition would result in an output for which price equalled average costs for the firms (including rent) and marginal cost to the industry.

[5] When we allow for this constraint, or indivisibility in the supply of factors required of the individual, the supply curve of labour to the industry is no longer the horizontal addition of the supply curves of the individual labourers, but a schedule of the number of positive responses to an all-or-nothing offer over a range of such offers.

the going wage-rate. Consequently, his own valuation of his marginal factor may fall short of, or exceed, that of the market.[1]

Furthermore, even if perfect competition did meet the optimum conditions laid down, these conditions themselves are only necessary conditions for a Pareto optimum. Since they are all in fact first-order conditions, they are consistent with a constrained minimum position (*a* in Fig. 1). Second-

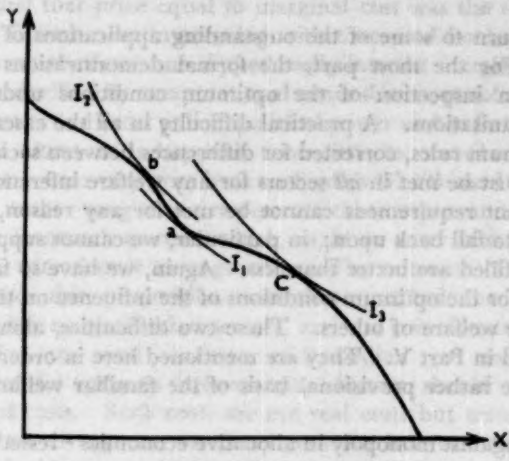

FIG. 1

order conditions are required which, as it happens, are no other than the stability conditions for equilibrium positions.[2] Nevertheless, even if the second-order conditions are fulfilled, or we have good reason to believe that the position in question is one of maximum, since only marginal conditions are involved we are assured only of a local maximum (*b* in Fig. 1), which may not, of course, be the largest maximum. True sufficient conditions, sometimes referred to as total conditions,[3] are needed for a genuine summit position. Such conditions require that for all movements, large or small, from the optimum in question, no other position can be reached at which "everyone" is better off.

[1] Even though his marginal valuation exceed the market price of his labour unit, by accepting the all-or-nothing offer he may still make a surplus, or rent, in the occupation.

[2] See Hicks [96, p. 704]. Reder [207, p. 45] adds that the attainment of stable equilibrium under conditions of perfect competition satisfy the second-order conditions. Which stability conditions are intended are nowhere to be found, but presumably the Marshallian conditions are in mind—that the demand curve for each product cut the corresponding supply curve from above. Actually, the sufficient conditions for a (local) maximum are more complex, resulting as they do from the expansion of $d^2W < 0$, W being the welfare function subject to the production constraints.

[3] See Hicks [96, p. 704]. The total conditions include the possibility of introducing a new good or ceasing to produce an existing good. Apparently no easily observable rules can be enunciated for the total conditions.

Finally, we must remind ourselves that a Pareto Optimum, or an ideal output, is but one of a large number of conceivable summit positions, each distinguishable from the others by a different pattern of welfare distribution.[1] It follows that, although there are particular optimal positions corresponding to any given non-optimal position which make "everyone" in the latter position better off, a movement from this given non-optimal position to *any* optimal position is not necessarily an improvement for "everyone."

We now turn to some of the outstanding applications of the optimum conditions. For the most part, the formal demonstrations involve little more than an inspection of the optimum conditions under alternative economic organisations. A practical difficulty in all the cases considered is that the optimum rules, corrected for differences between social and private valuations, must be met in *all* sectors for any welfare inference to be valid. If this stringent requirement cannot be met for any reason, there are no general rules to fall back upon; in particular, we cannot suppose that more conditions fulfilled are better than less. Again, we have so far ignored the consequence for the optimum conditions of the influence on the individual's welfare of the welfare of others. These two difficulties, along with others, will be treated in Part V. They are mentioned here in order to impress on the reader the rather provisional basis of the familiar welfare propositions which follow.

The case against monopoly in allocative economics [2] rested on its alleged restriction of output. This partial view of things was corrected by Kahn's ideal output [3] characterised by an equi-proportional degree of monopoly in all lines of production. In so far as Lerner, Reder and Little [4] reject this solution on grounds that the factor-product condition is not met, two points appear to have been overlooked. First, if Kahn's explicit assumption of a

[1] This is clearly recognised by Hicks [96, p. 701] and, later, by Reder [207, p. 38] and by Samuelson [222, p. 231–2]. In fact, the general proposition that we cannot identify an ideal allocation of resources unless we commit ourselves to a specific welfare function was argued—though in more informal terms involving utility—as far back as 1936 by Harrod (R. F. Harrod, "Another Fundamental Objection to Laissez-Faire," ECONOMIC JOURNAL, 1936).

On the other hand, Myint [189], who wrote of a "scientific welfare economics," seems to have put the matter too strongly in stating that the optimum conditions enable one to study "the purely mechanical efficiency of the economic system in satisfying individual requirements" without involving "any normative value judgments" [189, p. 118]. This language can easily convey the impression that allocative efficiency is something to the good which may be usefully pursued independently of any agreement on a desirable welfare distribution. But, as will be made explicit in Part III, an output combination that is "efficient" with respect to the existing welfare distribution may be "inefficient," and therefore non-optimal, with respect to another, possibly more desirable, welfare distribution.

[2] I think it would generally be conceded to-day that questions of stability, technical efficiency, innovation, the distribution of wealth and power, capture the interest both of the economists and the public more than do questions concerning the optimum output.

[3] R. F. Kahn, "Some Notes on Ideal Output."

[4] See bibliography, items 148, 207 and 161.

zero elasticity of the supply of all factors is accepted [1] the factor-product condition is, in effect, fulfilled. Second, if the view is taken that Kahn's assumption is too far at variance with the facts to be acceptable, perfect competition fares no better than equi-proportional imperfect competition. For, as we have already pointed out, perfect competition is consistent with fixed hours of work in all occupations which, effectively, precludes opportunities for marginal adjustments by factor-owners.

In the belief that price equal to marginal cost was the correct rule for industry, the Government intervening with taxes and bounties in order to correct for external effects, one slipped easily into the marginal-cost-pricing controversy bedevilled by computational conundrums, problems of administration, monetary and fiscal policy, political power and so forth. Allocative considerations alone, as it happens, have little to contribute.[2] An older element in the controversy goes back to Pigou's *Wealth and Welfare* of 1912, in which the author sought to demonstrate that output under competition was excessive inasmuch as rents which ought to enter into marginal costs were, instead, spread over average costs. The outcome of the discussion which followed this proposition was that—granted the prevalence of optimum conditions in all other sectors, and the coincidence of social and private benefits—the total increment of Ricardian rent and also, for that matter, all transfer rents on intra-marginal factors, should *not* in any case enter marginal costs. Such rents are not real costs but transfer payments, and there is no divergence, on these grounds, between competitive and ideal output.[3] However, we must remind ourselves again that price equal to marginal cost in all sectors is not by itself enough to meet the necessary conditions for an optimum. Further, even if these necessary conditions were met, and sufficient conditions also, there is no warrant for the assumption that such a summit position is, in any acceptable sense, superior to all non-summit positions.

The marginal-cost-pricing rule is yet less satisfactory when, as is generally the case, we envisage setting prices only for one or several industries, while having to acquiesce in a diversity of relationships between price and marginal costs in all other sectors of the economy. Finally, if it were decided, for lack of a better rule, to equate price to marginal cost in any case the particular methods used to cover costs in decreasing-cost industries have no direct

[1] This zero elasticity is to be taken to result from a combination of a zero substitution effect plus a zero wealth effect in the supply of factors.

[2] Few of the contestants in this field of controversy questioned the welfare basis of marginal-cost pricing. For instance, the chief issues raised by Coase [48 and 49], Thirlby [236], Nordin [192] and Vickrey [243], among others, turned upon the practicability and other advantages of alternative methods of covering costs.

Despite its title, I can find nothing in Nancy Ruggles' article [217] that provides a welfare justification for marginal-cost pricing.

[3] An excellent survey of this older controversy is to be found in Ellis and Fellner's 1943 paper [63].

allocative implications. They have welfare effects only inasmuch as they affect the real distribution of income in the economy.[1]

The taxation controversy is much of a piece with the monopoly one. Little,[2] in repudiating Henderson's allegation of an excess burden of indirect taxation,[3] argued that the alleged welfare superiority of direct taxation rested on its non-infringement of the existing ratios of prices to marginal costs. It was further required, however, that factor supplies were invariant, otherwise, whether taxes were direct or indirect, the factor-product condition was not met. In conclusion, since taxes on goods (including leisure) to which the individual is least responsive offend least against the optimum position, Little hazards the general statement, familiar from consumers' surplus analysis, that the least objectionable taxes are those on goods for which the individual's demands are least elastic. If there is a weakness in this analysis it is the restriction to a single individual which avoids the distributional complications.[4] For even a poll tax imposed on an already optimally organised economy is not neutral if its proceeds are redistributed among the community. It shifts the economy to a different optimal position—one in which some people are better off and others are worse off.

With the popularity of the indifference-curve technique, the original Bickerdike case for " incipient " tariffs [5] was revised, first by Kaldor in 1940,[6] then by Scitovsky, by Kahn, Meade, Johnson and Graaff,[7] to mention only the better-known contributors.

The basic idea is that although in a world of perfectly competitive economies free trade results in a world optimum, a country thinking only of its national welfare may increase its welfare, at the expense of other countries, by acting as a monopolist—selling less to foreign countries but on better terms. The simple demonstration that this is possible in the two-good, two-country model proceeds by use of Marshall's offer-curve technique plus the community indifference curves of the tariff country.

[1] In general, if an optimum were to be attained by universal application of the marginal-cost-pricing rule, or on some other formula, one can go no further on a purely allocative basis. For there are no allocative requirements for the pricing of the *intra* marginal units. Of the indefinite number of ways of covering costs (paying for fixed factors in the short period), including direct subsidies to the industry, two-part tariffs, discriminatory charges, all are consistent with the implementation of the allocative rule, though each affects in a different way the distribution of welfare. In this connection see Oort [194], especially the appendix.

[2] See bibliography, item 155.

[3] See bibliography, item 94.

[4] Essentially the same argument was put forward about the same time by Friedman [74]. He justifies his restriction of the analysis to a single individual by asserting his concern with " allocative " and not with " distributive " problems.

In justice to Friedman and Little, it must be allowed that they were explicit about many practical matters which forbade any sweeping policy conclusions.

[5] C. F. Bickerdike, " The Theory of Incipient Taxes," Economic Journal, 1906.

[6] See bibliography, item 122.

[7] See bibliography, items 228, 119, 172, 115 and 81.

The intersection at F in Fig. 2 of the offer curves [1] of countries A and B reveals the free trade equilibrium, country A importing OX of X in exchange for OY of Y, which is what country B imports in exchange for OX. By imposing a tariff on its imports, country A can reduce the domestic quantities demanded at any given international terms of trade, thereby reducing its effective-offer curve. The optimum tariff is one which generates

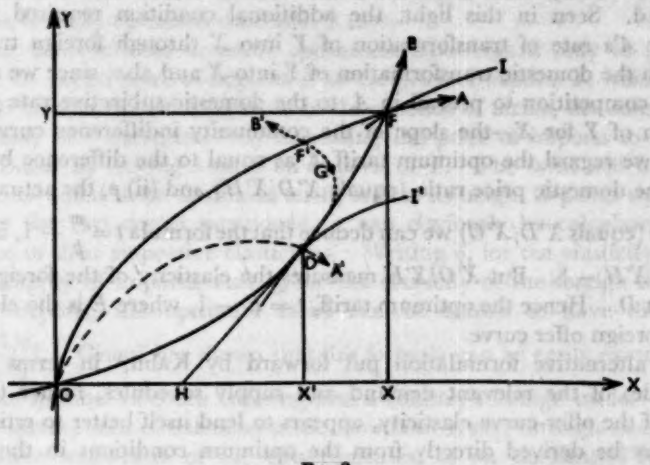

FIG. 2

an effective offer curve, A', intersecting B's unchanged-offer curve at D, at which point A's community indifference curve, I', is tangent to B's offer curve.[2] The measure of gain effected by the optimum tariff is indicated

[1] The offer curve for a country may be derived as follows: construct a terms-of-trade line tangent to the production frontier of a country already optimally organised. If these terms of trade differ from the initial domestic rate of substitution and transformation the new quantities of X and Y *produced* are indicated by the point of tangency of this line with the production-possibility curve; the new quantities of X and Y *consumed* by its point of tangency with the community indifference curve. The length, along this terms-of-trade line, from the production tangency to the consumption tangency represents the exchange of goods; of imports (excess of domestic consumption over domestic production of one of the goods) for exports (excess of domestic production over domestic consumption of the other good).

Swivelling this terms-of-trade line about the production possibility curve continuously alters the lengths representing exchange. When they are measured from a common origin, and radiate into the north-east (and south-west) quadrant, the pencil of such lengths describe that country's offer curve. Unless the two countries have the same terms of trade in their initial no-trade positions, their offer curves must intersect in one or other of the two quadrants.

[2] Community indifference curves are discussed in the next section. I have assumed here a single set of community indifference curves reflecting a "satisfactory" distribution of welfare. The redistributive effects of a tariff are offset by direct transfers of income in order to ensure that no individual is worse off as, with the improved terms of trade occasioned by the tariff, we move to higher community indifference curves.

In Graaff's treatment [84, p. 49], what he calls r "Bergson frontier" takes the place of the

by the movement from the community indifference curve I, in the free-trade position, to I' with the tariff. The tariff is an optimum inasmuch as I' is the highest achievable community indifference curve consistent with B's unchanged offer curve. Thus, it is not possible to move from D and make "everyone" in A better off.

For country A, the slope of B's offer curve represents the rate of transformation through foreign trade of Y, the good exported, for X, the good imported. Seen in this light, the additional condition required is that country A's rate of transformation of Y into X through foreign trade be equal to the domestic transformation of Y into X and also, since we assume perfect competition to prevail in A, to the domestic subjective rate of substitution of Y for X—the slope of the community indifference curve I' at D. If we regard the optimum tariff, t, as equal to the difference between (i) π, the domestic price ratio (equals $X'D/X'H$) and (ii) p, the actual terms of trade (equals $X'D/X'O$) we can deduce that the formula $t = \frac{\pi}{p} - 1$, is equal to $X'O/X'H - 1$. But $X'O/X'H$ measures the elasticity of the foreign offer curve at D. Hence the optimum tariff, $t = E - 1$, where E is the elasticity of the foreign offer curve.

An alternative formulation put forward by Kahn,[1] in terms of the elasticities of the relevant demand and supply schedules, rather than in terms of the offer-curve elasticity, appears to lend itself better to estimation and may be derived directly from the optimum conditions in the above paragraph. Since the rate of transformation through foreign trade must equal the domestic rate of transformation, (a) the marginal cost of importing X divided by the marginal revenue from exporting Y must be equal to (b) the domestic marginal cost of X divided by the domestic marginal cost of Y. If we take the foreign supply curve of A's imports to be upward sloping, the marginal cost to country A of importing X exceeds the foreign price of X by a proportion which varies with the elasticity of that supply curve. The foreign demand curve for A's export, Y, being downward sloping, the receipts from an additional export of Y fall short of its price, again by a proportion which depends on the elasticity of that demand curve.

In the free-trade position, then, where the international price ratio is equal to the domestic price ratio, the (a) ratio, representing the true inter-

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community indifference map. Such a frontier is constructed as the inner limit of all those community indifference curves which for the community have equal welfare value. Any point on this frontier, therefore, indicates the minimum quantities of goods required to attain a given value of social welfare. A criticism of the usual treatment of optimum tariffs, which treatment accepts the optimum tariff position as superior, actually or potentially (*i.e.*, using compensation tests), to the free-trade position, does not apply to Graaff's treatment. The Bergson frontier passing through D does not necessarily have a higher welfare value than that passing through the initial free-trade point, F.

[1] See bibliography, item 119.

national rate of transformation, exceeds the (*b*) ratio; which is to say, that it costs more to transform *Y* into *X* through trade than through domestic production. One therefore proceeds to reduce exports and imports (both by the same value in order to maintain balanced trade) until—with the marginal cost of importing *X* falling, and the marginal revenue from exporting *Y* rising (the respective marginal costs in home production moving in the reverse directions)—the (*a*) ratio is brought into equality with the (*b*) ratio, and the optimum condition is met.

Since, however, the domestic consumers have regard only to (*c*), the ratio of the actual price of imports *X* to the price of exports *Y*, which ratio is always smaller than the (*a*) ratio in the absence of tariffs, the consumers' choice may be "corrected" by increasing the price of imports to the required extent by levying a tariff on imports of *Y*. The tariff which makes these ratios equal is the optimum tariff, and as its height depends upon the shape of the two curves mentioned, it can obviously be calculated with reference to their respective elasticities. Writing η_s for the elasticity of the foreign supply of imports, and η_d for the elasticity of the foreign demand for *A*'s exports, the optimum tariff can be shown to have the form $\frac{1/\eta_s + 1/\eta_d}{1 - 1/\eta_d}$. Graaff has shown that this formula can be easily extended to cover any number of goods entering into a country's foreign trade.[1]

The assumptions of balanced trade maintained, say, through changes in the relative wage-rates of the two countries, of an unchanged level of employment in *A*, of universal competition and an absence of external effects, are exacting enough, to say nothing of the distribution problem. Even if we grant all this, the formulæ, as Graaff points out,[1] do no more than reveal the relationships which are to obtain in the the optimum situation. Guesses at tariff heights using the existing elasticities, if they can be obtained, may be wide of the mark, since the elasticities in question will themselves vary with the height of the tariff.

In conclusion, while there is little doubt that some countries may be in a position to improve their terms of trade with the outside world at some small sacrifice, if any,[2] in imports, the idea of an optimum tariff with its suggestion that there is some calculable set of tariffs which, in the absence of retaliation, is best for a country is all too facile. Quite apart from the stringent conditions and practical difficulties involved, the welfare significance of this optimum tariff is tenuous in the extreme. We already know that in the event that all the optimum conditions are fulfilled (including,

[1] See bibliography, item 84.

[2] If at the free-trade equilibrium *B*'s offer curve were sufficiently inelastic (less than unity), then some tariff imposed by *A* can improve that country's terms of trade while also increasing the volume of its imports. To illustrate, if *B*'s offer curve were *B'* in Fig. 2, intersecting *A* at *F'*, a tariff could reduce *A*'s effective offer curve to intersect *B'* at, say, *G*. Country *A* now imports more and exports less.

here, the foreign-trade optimum condition) in all sectors, the best we can hope for is a Pareto optimum, a necessary condition for a maximum of social welfare. Since there are actually an indefinite number of such summit positions, each corresponding to a different initial pattern of welfare distribution, there are in principle an indefinite number of optimum tariffs. Until we have some rule, evolved from ethical considerations, by which we may choose among the alternative summit positions open to us, there is no warrant for moving to any one of them guided by a set of optimum tariffs calculated on the basis of the existing welfare situation—assuming such calculation practicable. For, as we shall affirm in Part III, there is no acceptable definition of welfare by which an existing non-summit position may be judged inferior to *all* attainable summit positions.

III. The Choice of Welfare Criteria

With the advent of "The New Welfare Economics" in 1939 there began a period of cautious optimism. It was not to last long. Two years later, in an ingenious paper,[1] Scitovsky demonstrated that the apparently felicitous device of hypothetical compensation advanced by Kaldor and promoted by Hicks was quite capable of giving contradictory results. And, though the device was promptly amended to preclude the particular perversity uncovered by Scitovsky, the damage began to spread. Little's fastidious examination of 1949 left the idea of hypothetical compensation, as a criterion of welfare, in a dubious state.[2] It was left to Samuelson to push the logic of Scitovsky's initial discovery to its conclusion: that, in general—if we exclude comparisons between situations in one of which there is more of "every" good—it was not possible to rank alternative economic organisations on the basis of compensation tests.[3] Arrow's sweeping essay on social choice added to the scepticism which gathered force in the fifties,[4] so that when Graaff's thesis appeared in 1957 [5] its elegant nihilism did little more than reflect the prevailing mood.

The controversy over welfare criteria was marked by greater critical insight, in respect both of ethical implications and the applicability of deducible propositions, than the more abstract dissertations on the optimum conditions. Interest in these criteria is, moreover, more easily sustained both because of the more explicitly ethical content and by virtue of a clear evolution of the compensation device which we follow in some detail, an evolution which, as it happens, links up eventually with the concept of a Pareto optimum regarded as a necessary condition for a position of maximum social welfare.

[1] See bibliography, item 227.
[2] See bibliography, item 221.
[3] See bibliography, item 154.
[4] See bibliography, item, 14.
[5] See bibliography, item 84.

Compensation Tests

The formulation of the principle of hypothetical compensation [1] arose out of the controversies of 1938–39 in the ECONOMIC JOURNAL. Harrod,[2] illustrating the traditional acceptance of interpersonal comparisons of utility by reference to the repeal of the corn laws in 1846, had argued that the gain to the community as a whole might be regarded as exceeding the loss to the landlords only if the individuals affected were treated as equal in some sense. While he was prepared to go along with this, Robbins was not.[3] To him this assumption of equal capacities for satisfactions was unwarrantable.

Without challenging Robbins' view of the scientific status of interpersonal comparisons, Kaldor denied their relevance for prescriptive statements.[4] Indeed, according to Kaldor, the classical argument for free trade involved no such arbitrary element, the essence of the argument being that the Government could so compensate the losers as to make "everyone" better off. The compensation test implied by this view was to be understood as an objective test of economic efficiency and, according to Kaldor, prescriptions based on it had a scientific status detached from any value judgment. Thus, whether one should compensate or not, he submitted, was a political question on which the economist could merely pronounce an opinion.[5]

Hicks,[6] who found much to admire in the structure of the traditional welfare economics while deprecating their foundations, eagerly grasped this notion of examining the efficiency of alternative economic organisations without reference to the question of distribution, and particularly without

[1] The terminology varies from time to time, and from one writer to another. The most common terms are compensation test, or compensation criterion; principle of compensation, or of potential or hypothetical compensation (with "overcompensation" frequently substituted for "compensation" in all these terms).

[2] R. F. Harrod, "Scope and Method of Economics," ECONOMIC JOURNAL, September 1938.

[3] L. C. Robbins, "Interpersonal Comparisons of Utility," ECONOMIC JOURNAL, December 1938.

[4] See bibliography, item 123.

[5] Stigler [233] objects to the compensation principle inasmuch as its adoption would apparently sanction compensation of successful thieves for the amounts they would otherwise steal, thereby releasing resources engaged in maintaining law and order. In general, he argues, not only thieves and protected industries but anyone contemplating social mischief would, on this principle, be dissuaded from taking action by adequate compensation. As a principle, therefore, it is repugnant to our moral code.

But in fact the compensation principle asks only whether losers *could* be compensated: it does not require that they *should* be compensated. Consequently, from the successful application of the compensation principle to stealing, or tariff protection, nothing more may be inferred than that their removal would increase "efficiency." Whether, and in what manner, compensation should take place, if it should take place at all, is a question of distribution on which our moral sense has to be consulted. Indeed, the declared aim of the compensation test, as Kaldor stresses, is to separate the question of "efficiency" from that of distribution.

See also a comment on this paper by Samuelson [220].

[6] See bibliography, item 96.

reference to the comparisons of satisfactions as between individuals.[1] Defining an optimum position along Paretian lines,[2] he pointed out that although there was not one but an infinite number of such optima, each differing from the others by a particular distribution of welfare, one could lay down universally valid conditions for such an optimum.[3] If these conditions were not met the position was not one of optimum and, consequently, " everyone " could be made better off in moving to some optimum.

While Hicks followed Kaldor in using the notion of compensation as a wedge between efficiency and distribution, he was more cautious on the question of prescription and toyed with the idea of linking economic reform based on efficiency alone with some measure of actual compensation designed to make it more acceptable from the point of view of distribution, albeit not without reminding us that transfers of wealth might well reduce efficiency.

Scitovsky's paper, two years later,[4] is memorable chiefly for its apparently paradoxical demonstration, that having shown a position II to be more efficient than a position I on the Kaldor–Hicks criterion, the same criterion might well reveal, following the community's adoption of the II position, that I was now more efficient than II.[5] With this in mind, the new criterion suggested by Scitovsky was, as might be expected, that which required the result of the original Kaldor–Hicks test to be consistent with that of the " reversal " of this test—by which is meant the original test applied, now, to a movement from II to I. Only if *both* tests disclosed II to be better than I, or I to be better than II, was the Scitovsky criterion fulfilled. Any other outcome was ambiguous.[6]

[1] This, according to Hicks, was one of the three weak links in Pigou's valuation of the social income. The other two were: (1) the distinction between welfare and economic welfare (though this seems to be less a distinction of principle than of measurability), and (2) the measurement of the real value of the national dividend. However, as Hicks does point out, Pigou's welfare propositions refer to *changes* in the national dividend and, therefore, in no way depend upon his success in measuring the national dividend as a whole.

[2] Implicit in the definition of a Pareto optimum is a Paretian criterion that a position II is superior to I if, in moving to II, " everyone " is actually made better off. But its range of application is likely to be limited. It may be said that Kaldor's achievement consisted in transforming the Paretian criterion from an actual to a potential situation; II, that is, qualifies as the better position if, in the movement from I to II, " everyone " *could* be made better off. In effect, Kaldor followed Pigou's procedure in dividing welfare economics into propositions about the value of the product and those about distribution. Pigou's indicator for an increase in the national dividend, it should be recalled, was in fact just such a compensation test (*The Economics of Welfare*, 4th edition, pp. 50–5).

[3] Hicks' marginal conditions required that the rate of substitution between any two goods (including factors) were the same for each individual and each producing unit. His stability conditions ensured that the position was one of maximum, and not of minimum. His total conditions (which in fact comprehended the stability conditions) would ensure the impossibility of improvement by introducing, or abandoning, any product or factor.

[4] See bibliography, item 227.

[5] It should be borne in mind, however, that positions I and II being compared were not, in the Scitovsky treatment, full optimum positions. In his main demonstrations they were two bundles of goods, each divided between a two-person community such that the exchange optimum prevailed in the division of each bundle.

[6] Scitovsky put it slightly differently. He considered two possibilities, (1) a II position in which redistribution of the II product made " everyone " better off than he was in I, and (2) a

To apprehend the nature of the Scitovsky paradox,[1] and some of the finer points emerging from the further development of welfare criteria by Samuelson and others, familiarity with two popular constructs in welfare economics, the community indifference map and the utility possibility curve, is of great expository value. The former is elaborated below and then employed to shed light on Scitovsky's initial and somewhat esoteric demonstration. The latter construct will be explained later, prior to a consideration of Samuelson's distinguished paper of 1950.

A direct analogy with the individual indifference curve suggests that the community indifference curve be a locus of combinations, or "bundles," of goods as between which the community is, in some sense to be defined, indifferent. It has been found useful to define this indifference in such manner that for any point on the curve (representing a bundle of goods which may be chosen by the community) it is not possible to make "everyone" in the community better off. The exchange optimum, therefore, obtains at every point along the community indifference curve. In consequence, at every such point the rate of substitution between goods is the same for each of the individuals in the community.

Let us illustrate the geometric construction of a community indifference map for a community of two individuals, A and B, whose respective indifference maps are indicated in Fig. 3.[2] Since we may form a community indifference curve from any pair of the individual curves, let us start by choosing a_1 and b_2. The community indifference curve to be constructed therefrom is to have the property that, at all points along it: (i) the individuals A and B maintain their respective levels of welfare, a_1 and b_2, and (ii), as mentioned, the rate of substitution be the same for each individual for any division of the bundle of goods held in common.

If, therefore, we place the origin of B's map diagonally opposite to that

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I position in which redistribution of the I product made "everyone" better off than he was in II. If (1) were possible and (2) impossible, then we could say that II was the more efficient position. Conversely, if (1) were impossible but (2) were possible, then I was the more efficient alternative. Whereas if both were possible we could say nothing. Other possibilities, such as II better than I by the original test and equal to I by the reversal test, were ignored.

[1] Scitovsky's attitude is less vulnerable than might appear from a reading of later criticisms. If he appeared to accept compensation tests as tests of efficiency he did so: (*a*) because the more acceptable Paretian criterion was likely to be satisfied very rarely, and (*b*) because in any case the "principle of compensated adjustment"—the fulfilment of the Kaldor–Hicks test plus actual compensation in order to make "everyone" actually better off, which gives the effect of implementing the Paretian criterion—obviously favoured the *status quo*. Nevertheless, he was not willing to prescribe policy solely on the basis of these tests, and without reference to social justice.

Furthermore, he anticipated Samuelson in defining II to be more efficient than I if for every distribution of welfare each person in II could be made as well or better off than he was in I, a criterion which would be fulfilled if there was an increase in at least one good without there being a reduction in any good. Notwithstanding this generalisation, he held that only two distributions really mattered—a position later taken up by Little in his more down-to-earth approach—that before the change and that after.

[2] This follows my treatment in 1952 [177]. Graaff has a similar geometric treatment. Scitovsky [228] and Baumol [24] also go into the construction of this curve in some detail.

of *A*'s origin and, keeping *B*'s axes parallel to those of *A*, move *B*'s map until b_3 just touches a_1 at, say, *c'* in Fig. 4, then the point *Ob* (the origin of *B*'s map) taken with reference to *A*'s origin, *Oa*, represents a point on the required community indifference map. Another such point would be *Ob'*, *B*'s map having been moved downward to the right and adjusted so that, once again,

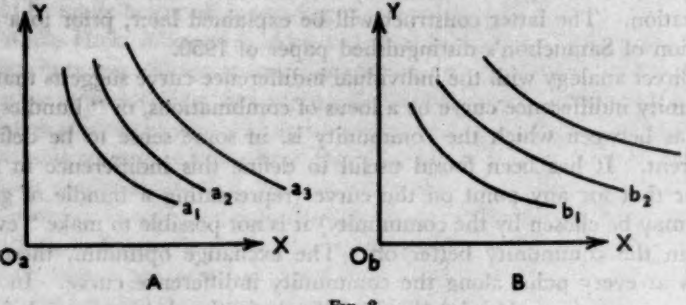

FIG. 3

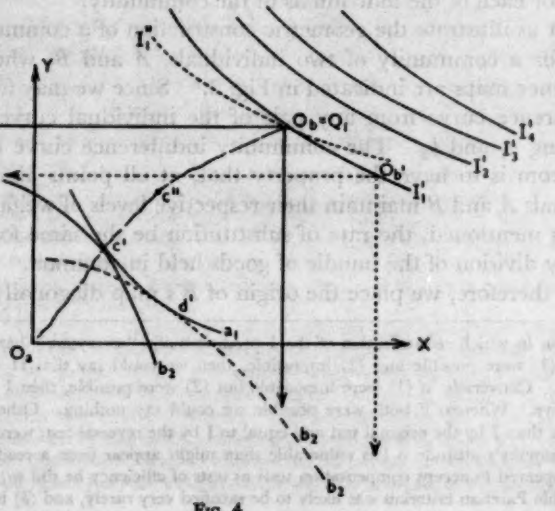

FIG. 4

b_3 just touches a_1, this time at *d'*. Clearly, by moving *B*'s map continuously downward to the right, and then upward to the left, b_3 at all times being placed tangential to a_1, *B*'s origin describes the community indifference curve I_1', having the desired properties (i) and (ii).

Two further observations are necessary before proceeding. First, given any point in the *X*–*Y* quadrant, say Q_1, as represented by *Ob* in Fig. 4, the particular community indifference curve we have constructed, I_1'—representing the sum of the individual welfares a_1 and a_2—is not the only

community indifference curve which may pass through Q_1 having property (ii). For we could divide this bundle Q_1 between A and B in an indefinite number of ways, taking care always that, whatever the distribution chosen, the rate of substitution be the same for both individuals. Under this restriction, therefore, redistribution is confined to movements along the contract curve of Q_1. If, for instance, we move along the Q_1 contract curve from c' to c'', the latter point being the mutual tangency of a_3 and b_1, a new community indifference curve I_1'' can be generated from these individual curves in the way described. I_1'' and I_1' cannot, of course, be compared on the Paretian criterion—that "everyone" is better off on one of these community indifference curves compared with his being on the other—since in moving from I_1' to I_1'' individual B is worse off while A is better off. Indeed, we can derive a whole pencil of such non-comparable community indifference curves passing through Q_1, each corresponding to a different division, along the contract curve, of the Q_1 bundle. It is, clearly, a consequence of property (ii) that each of these community indifference curves passes through Q_1 at a slope parallel to the mutual tangency (on the contract curve) of the individual indifference curves from which it is generated.

Second, if we use the Paretian criterion to rank the community indifference curves its consistent application presents us with a map of non-intersecting community indifference curves.[1] For instance, having I_1' as representing individual welfares a_1 and b_2, we could proceed to construct I_2' from, say, a_2 and b_2, I_3' from a_3 and b_3, I_4' from a_2 and b_7 and so on—"everyone" being better off in each successively higher community indifference curve. Such curves we may call *comparable*. They form part of a consistent community indifference map. Obviously, quite a number of other consistent maps may be constructed on this principle, beginning with, say, I_1', though, in general, it will not be possible to move from a curve of one of these maps to that of another.

Fig. 5 illustrates the Scitovsky case with two alternative bundles of goods, Q_1 and Q_2. The existing division of Q_1 between A and B is given by c' on the contract curve OQ_1, with I_1' representing the community indifference curve proper to that distribution. On the other hand, the existing distribution of Q_2 is indicated by c'' on the contract curve OQ_2, with the community indifference curve I_2'' corresponding to c''. If, now, I_1' and I_2'' were directly comparable we could move direct from one to the other and fulfil the Paretian criterion of an improvement in the community's welfare. They are not comparable, however, and we therefore have recourse to the Kaldor–Hicks criterion, which devises comparability through

[1] It does not follow, however, that successively higher non-intersecting community indifference curves fulfil the Paretian criterion. Individual indifference maps which were identical and homogeneous would yield a unique set of non-intersecting community indifference curves. Irrespective of the manner in which the individual curves were combined, only one curve would pertain to a given bundle of goods.

hypothetical compensation. Through Q_2 we proceed to construct a community indifference curve I_1' that is comparable with I_1'. Apparently, then, there is some division of the Q_2 bundle—that from which I_2' has been generated—which does make "everyone" better off than he is with the Q_1 bundle. If we act on this criterion and arrive safely at Q_2, however, we discover that Q_1 beckons us with exactly the same happy prospect. For we may construct I_1'' through Q_1 comparable with and, as it happens, above I_2''.

The apparent paradox is easily explained. With the distribution c' of the Q_1 bundle, the common rate of substitution is, say, $2Y = X$. With X twice as valuable as Y for the community, the bundle Q_2, which differs from Q_1 in having, let us say, one more of X and one less of Y,[1] must be reckoned

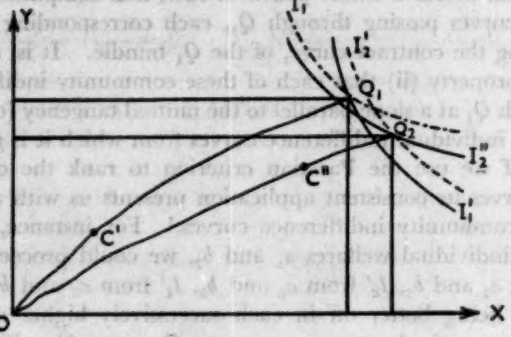

FIG. 5

by the community as the more valuable of the two. Having moved to Q_2, however, the new distribution of that bundle is that indicated by c'', a distribution which happens to be associated with a common rate of substitution $Y = 2X$. But on these relative valuations, Q_1 is, for the community, clearly the more valuable of the two bundles. This inter-relationship between relative valuation and distribution is the source of elusiveness and paradox which runs through so much of the initial controversies on welfare criteria and index numbers.

Little's Criterion

In respect of welfare criteria, Little's "Foundations" paper of 1949,[2] developing more systematically the ideas put forward in Scitovsky's 1942 "Note,"[3] represents the most critical opposition to the original Kaldor

[1] So small a difference between the two bundles is adopted to suggest that we may effectively ignore those changes in the community's rate of substitution that result only from a movement along the community indifference curve.

[2] See bibliography, item 154.

[3] See bibliography, item 227.

dichotomy between efficiency and distribution. He is no less critical of the purism of Robbins, since the impossibility of scientific inter-personal comparisons of welfare is not relevant to propositions about group welfare—though not for the reasons put forward by Kaldor, that they might be circumvented by the device of hypothetical compensation. It is not relevant simply because one no longer believes that propositions about group welfare require the adding together of the (cardinal) utilities of the various individuals.[1]

Value judgments, affirms Little, in particular those about distribution, cannot be avoided in welfare economics. We should, however, make them explicit and, if we wish to carry the reader with us, endeavour to make them widely acceptable. To say that a policy which meets the Kaldor–Hicks criterion increases the "efficiency" of society is, in effect, to recommend it. Whereas if the value judgments implicit in the criterion are bared, it is unlikely to find favour with many people. Compensation is, after all, only hypothetical: it is consistent with making the poor yet poorer. Hence, to announce, as did Kaldor, Hicks and others at that time, that an objective method of detecting increases in "wealth" or "efficiency" had been discovered, is to mislead opinion by the use of persuasive words. Nothing had been discovered. Kaldor had merely coined a *definition* of efficiency, one whose ethical implications, as it happens, are hardly acceptable.

Turning to the more positive part of his analysis, Little explicitly favours the piece-meal approach to what he calls utopianism, or the all-or-nothing approach of Bergson, Samuelson and others. The value premisses on which his criterion will rest are: (i) that the individual is deemed to be better off in a chosen position than he is in any other position, and (ii) that a movement to a situation in which "everyone" is better off is a good thing. The criterion he lays down, reminiscent of Pigou's dual criterion, is that, in so far as welfare is affected only by the economic variables under consideration, the change to a new situation ought to be made: (*a*) if the new distribution is no worse than the old, and (*b*) if it is impossible to make "everyone" as well off in the original position as he would be after the change.

Three things are worth noticing: first, that Little does not commit himself to the extent that Pigou does in the matter of distribution, though one is left with the impression that, like Pigou, he would consider a general reduction of inequality, *cet. par.*, a good thing. Second, that part (*b*) of the criterion amounts to the fulfilment of the Kaldor–Hicks reversal test for a movement from I to II which Scitovsky had proposed to ensure consistency after the original Kaldor–Hicks test was met. Little refers to this reversal

[1] Indeed, inter-personal comparisons of themselves are not value judgments but judgments of fact resting upon observation and introspection. A "desirable" distribution of real income is, on the other hand, obviously a value judgment. Thus, while we may agree on what constitutes an ideal distribution of real income, differences in our judgments of the facts may preclude agreement on the specific distribution of money, or goods, in the community.

test as the "Scitovsky criterion."[1] Third, an implication in the first edition of the *Critique*[2] that comparisons of *relative* welfare distributions could be made. Such comparisons would require, as Arrow remarked in the review of that edition,[3] both the possibility of inter-personal comparisons and the measurement of cardinal utility.[4]

The particular method employed by Little in judging whether a movement from the initial situation I to an alternative situation II is an improvement for the community is to pose three questions: (i) Is the Kaldor–Hicks criterion satisfied? (ii) Is the "Scitovsky criterion" satisfied? (iii) Has II a better distribution than I? Since the answer to each of these three questions is either a yes or a no, eight different combinations of answers to (i), (ii) and (iii) are possible. In his second edition, in order to meet criticisms of his earlier edition of the *Critique*, particularly those of Arrow and Baldwin,[5] Little considers the eight possible combinations first under assumption A: that purely distributional changes are not possible.[6]

We may usefully classify his results as follows: of four combinations (out of the eight possible) (i) and (ii) are both satisfied in two of these combinations, and are both *not* satisfied in the other two combinations, while the answer yes to question (iii) occurs only once, in one of the former pair of combinations. For that combination then, in which (i), (ii) and (iii) are satisfied, a movement from I to II is prescribed. Of the remaining four combinations, the answers to (i) and (ii) are opposites in all cases. In two of these cases, however, the answer to (iii) is yes, and therefore, as it transpires, a movement to II is prescribed in either case.

The sanction for a movement to II in the latter two cases may require a word of explanation. Suppose that the Kaldor–Hicks test shows II to be better than I (though the "Scitovsky criterion" gives the opposite result), it follows that a movement from I to II′—II′ being the hypothetical distribution of the II bundle which renders it comparable with that of the I bundle—would make "everyone" better off. We now make a further imaginary journey from II′ to II, II being the initial distribution of the II bundle. From (iii) being answered in the affirmative, we know that II is better than, or at least no worse than, the II′ distribution of that bundle.

[1] From now on, quotation marks will distinguish it from Scitovsky's declared criterion which required the fulfilment of the Kaldor–Hicks test, for a movement from I to II, *plus* the non-fulfilment of the reversal test.

[2] See bibliography, item 160.

[3] See bibliography, item 11.

[4] A comparison could be made, however, by use of the notion of comparability of distributions. If II′ represents a distribution of the II bundle which is comparable with the existing distribution of the I bundle, and if the initial distribution attaching to the II bundle is better than this II′ distribution, then the II distribution may be said to be better than the I distribution. It is along such lines that Little proceeds in his second edition.

[5] See bibliography, items 11 and 19.

[6] In his first edition Little made the arbitrary assumption that a redistribution of welfare was possible before the change to the new position, but not after, with results that were criticised by Arrow [11] and Baldwin [19].

The total welfare effect may then be regarded as a compound of two improvements: a movement from I to II′ which makes "everyone" better off, followed by a movement to II—which is to a better distribution of that bundle, or at least to one that is not worse.[1] We explain the other case in a similar fashion, though beginning the other way round. A distributional change from I to I″—I″ being that hypothetical distribution of the I bundle which is directly comparable with that attaching to the II bundle—is, by (iii), an improvement if anything. While, since the "Scitovsky criterion" is met, a movement from I″ to II makes "everyone" better off.[2] To conclude under assumption A, if the Kaldor–Hicks criterion, or the "Scitovsky criterion," or both, are met, and, in addition, the redistribution involved is, at least, not worse, then a movement from I to II is recommended.

[1] In Fig. i let Q_1 and Q_2 be the two bundles, and I and II their corresponding community indifference curves. II′ is a community indifference curve passing through Q_2 which is comparable

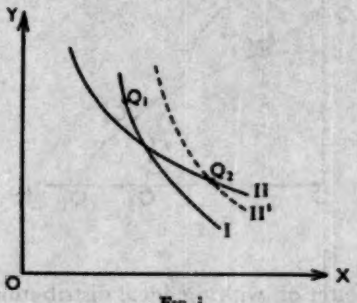

FIG. i

with I. Hence the Kaldor–Hicks criterion is satisfied. If the community moves to Q_2 but maintained the II′ distribution "everyone" would be better off. A further improvement takes place in adopting the II distribution of Q_2.

[2] In Fig. ii the initial improvement arises from I″, which is a better distribution of the bundle

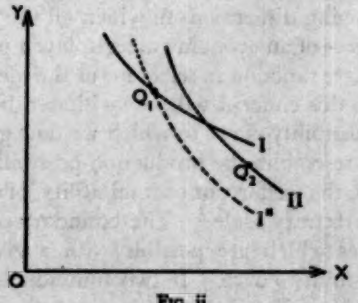

FIG. ii

Q_1, and one comparable with the II distribution of Q_2. A movement from I″ to II now makes "everyone" better off.

Following this exercise, Little considers these possible combinations under assumption B, that all distributional changes are possible. This means that "intermediate" positions such as II' and I'' are not merely hypothetical but directly attainable as, of course, is any other distribution. The trouble about such an assumption, as Arrow pointed out,[1] is that in the event of its adoption the logical procedure would be to move towards the attainment of an ideal distribution of welfare with any bundle of goods. Indeed, if all restrictions on direct redistributions were removed the only test open to us would be the straightforward Paretian criterion: we should

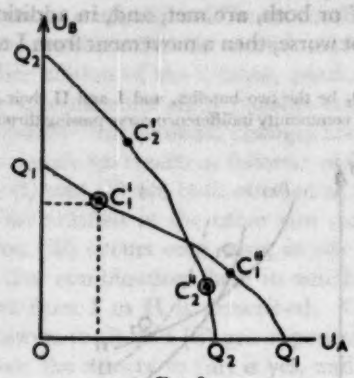

FIG. 6

ask, is "everyone" better off with the ideal distribution of a new bundle II compared with the existing and comparable distribution of the bundle I.

Samuelson's Criterion

Further pursuit of welfare criteria is possible along a rather different route, one which begins with further consistency tests and leads inexorably to a concept of Bergsonian dimensions in which all the welfare potentialities inhering in the resources of an economy are displayed prior to eliciting some acceptable social-welfare function to select for us the ideal pattern of welfare. Our progress towards this concept will be facilitated by the employment of Samuelson's utility-possibility curve to which we now give brief attention.

In construction it resembles the production-possibility curve except that, along each of the axes, the welfare, or ordinal utility, of one of the individuals is measured on any arbitrary scale.[2] The boundary of all combinations of the individual utilities which are possible with a given bundle of goods forms the utility-possibility curve. If two individuals, *A* and *B*, share a

[1] See bibliography, item 11.

[2] With ordinal, and non-comparable utility, the scale used on each axis is arbitrary in everything except order.

bundle Q_1, such a curve may be mapped from data summarised along the contract curve of Q_1, since each point on the contract curve—and, for that matter, a corresponding point on the utility-possibility curve—may be viewed as providing the maximum utility to B consistent with a given utility to A.

The initial division of the Q_1 bundle, in Fig. 6, is represented as the point c_1' on the utility-possibility curve Q_1Q_1. Since B's utility cannot increase without that of A diminishing, the boundary Q_1Q_1 is downward sloping to the right. Q_2Q_2 is the utility-possibility curve corresponding to the Q_2 contract curve, with c_2'' indicating the individual utilities corresponding to the existing division of that bundle. In order to compare the alternative bundles Q_1 and Q_2 using the Kaldor–Hicks criterion, we move along the Q_2Q_2 utility curve from c_2'', the existing distribution—increasing B's welfare at the expense of A's—to c_2', a point north-east of, and therefore comparable with, c_1' on the Q_1Q_1 curve. Having thus satisfied the Kaldor–Hicks test, we now try the reversal test, which will be based on the c_2'' distribution of the Q_2 bundle. From c_1' we move along Q_1Q_1 to c_1'', a point to the north-east of, and therefore comparable with c_2'', in this way making both individuals better off with the Q_1 bundle.[1] Since Q_2 is superior to Q_1 by the original test and Q_1 superior to Q_2 by the reversal test, the criterion proposed by Scitovsky is not fulfilled. If the decision to move from one position to the other depended solely on these compensation tests we should have no warrant to change the initial position.

But suppose the Scitovsky criterion were met? Quite apart from the ethical objections voiced by Little and others to using compensation tests as a sufficient criterion of an improvement in economic organisation, we apparently run into logical difficulties if we persist in its application. For, as Gorman [2] has pointed out, the Scitovsky criterion may lead us round in circles if adopted as a welfare criterion. To use his illustration, c_1, c_2, c_3 and c_4 indicate the welfare distributions pertaining to four bundles of goods, Q_1, Q_2, Q_3 and Q_4 respectively, whose utility possibility curves are shown in Fig. 7. Bundle Q_2 is easily shown superior to Q_1 by the Kaldor–Hicks test, while Q_1 cannot be shown superior to Q_2 by the reversal test. Hence, by the Scitovsky criterion, Q_2 is better than Q_1. By the same criterion, Q_3 is shown superior to Q_2, and, again, Q_4 is shown to be superior to Q_3. Transitivity requires that Q_4 be superior to Q_1. But it is manifest from the figure that, by the Scitovsky criterion, Q_1 is superior to Q_4.[3] Clearly, the Scitovsky criterion—and, therefore, the Kaldor–Hicks criterion also—is not transitive,

[1] Though, admittedly, it summarises the Scitovsky paradox with greater facility than the community indifference curve technique, the latter provides greater insight inasmuch as it points up the dependence of relative valuation on distribution.

[2] See bibliography, item 79.

[3] We could demonstrate this intransitivity just as well if, along the axes, we measured goods instead of utility, and treated the curves as community indifference curves, the points c_1, c_2, c_3 and c_4 being alternative bundles of goods.

and could not be used alone [1] as a guide to policy without risk of contradiction.

Even for a straight choice between two alternatives we may be dissatisfied with the Scitovsky criterion. Though a movement from Q_1 (with

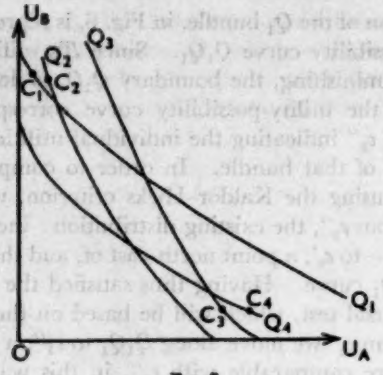

FIG. 7

the attached c_1' distribution) to Q_2 (with the attached c_2'' distribution) meets the Scitovsky criterion in Fig. 8, we cannot allow that Q_2 is *potentially* superior to Q_1 when it is superior for only two alternative distributions of

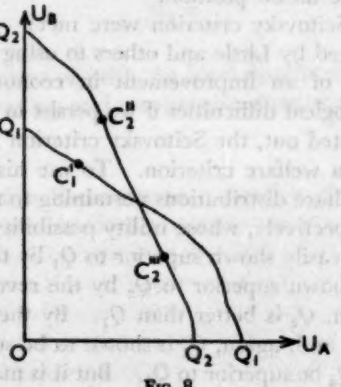

FIG. 8

welfare; at least, not unless, in the nature of the problem, these two distributions are the only ones admissible. If, for example, we had to consider

[1] While Little's adoption of the "Scitovsky criterion" may appear vulnerable on these grounds, we must remember that his criterion also demands an acceptable distribution of welfare prior to any change being recommended. The Gorman demonstration of intransitivity does apparently depend on marked differences in the distribution of some of the bundles. Provided, then, that the acceptable range of welfare distributions was narrow, the fulfilment of Little's criterion would preclude, on distributive grounds, such contradiction.

distributions comparable with c_2''', which would show Q_1 superior to Q_2, we could no longer assert that Q_2 was potentially superior to Q_1. Indeed, if, as Samuelson suggests,[1] we put aside for the present the question of distribution in the belief that, at a later stage, we may have the choice of any ("feasible") distribution, a much more stringent criterion is required to designate a potentially superior bundle; namely, Q_2 is potentially superior to Q_1 only if for every conceivable distribution Q_2 is superior to Q_1—if, that is, the Q_2Q_2 utility-possibility curve is at all points outside that of Q_1Q_1. A sufficient (though not a necessary) condition for Q_2 to be potentially superior to Q_1 and, to fulfil, therefore, Samuelson's criterion of an increase in "potential real income," is that Q_2 have more of "every" good than Q_1.[2]

[1] See bibliography, item 221.

[2] In view of Samuelson's welfare discussion in his 1950 paper being closely bound up with his examination of index numbers as indicators of a potential increase in the community's real income, a few words on the close relationship between index numbers and compensation tests may be of interest.

For the consistent individual,

$$\Sigma p_2 q_2 \geqslant \Sigma p_2 q_1 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (a)$$

implies

$$\Sigma p_1 q_1 < \Sigma p_1 q_2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (b)$$

From (a) we can infer that the q_2 bundle is preferred to the q_1 bundle, for in the II situation—that in which the p_2 prices are available—he spends on the q_2 bundle as much, or more, than the cost of the q_1 bundle. (This, indeed, is the interpretation of the (a) notation.) Thus, he could have had the q_1 bundle at the prices ruling in II, but chose instead to spend as much, or more, on the q_2 bundle—clear evidence of his preference for the q_2 bundle. Now, if instead of (a) we had the situation

$$\Sigma p_1 q_1 \geqslant \Sigma p_1 q_2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (c)$$

similar reasoning would point to a preference for the q_1 bundle. Since he cannot prefer both q_2 and q_1, (c) is not consistent with (a). If (a) is established, we must cross out the greater-than-or-equal-to sign of (c), which, therefore, renders it (b). The sense of (a) and (b) in terms of indifference curves can be seen by the reader in Fig. iii without the need for comment.

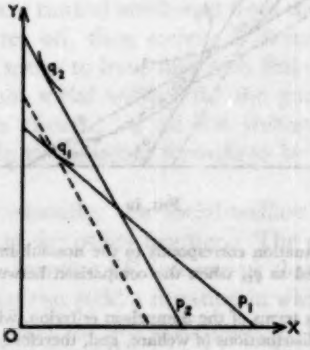

FIG. iii

In the case of the community, however, the simultaneous observation of (a) and (c) does not necessarily indicate inconsistency. In view of the intimate relationship between welfare distribution and relative prices, non-comparable indifference curves attaching to the bundles q_1 and q_2

For some central range of the bundles on the production-possibility curve, all the corresponding utility-possibility curves will overlap. The outer envelope of these overlapping curves, which we may refer to as the utility frontier,[1] is indicated by *FF* in Fig. 9. Regarded as the boundary of all utility combinations possible with the given resources of the economy, *FF* summarises the data which in principle can be made available without any ethical presuppositions other than: (*a*) that the individual is the sole judge of his own welfare, and (*b*) that the welfare of the community depends only upon the welfares of the individuals who comprise it. And only at a later stage, when choosing as between alternative combinations of individual welfares, are the ethics of distribution involved. The search for a satisfactory test of a potential welfare improvement using only compensation tests has—in its comprehension of all conceivable welfare distributions—joined with the concept of all existing production possibilities to issue in a construct, the utility frontier of society which, though it contains no ethical presuppositions other than an acceptance of individual choice, provides the basic data of welfare possibilities necessary for a comprehensive social choice determined by any method.

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may intersect as shown in Fig. iv. With the p_2 prices, q_2 has the higher value for the community, and (*a*) obtains. This situation corresponds to the fulfilment (for a movement from q_1 to q_2) of the Scitovsky reversal test—q_2 being preferred to q_1 when the comparison is based on the I_2 distribution of welfare. On the other hand, with the p_1 prices, q_1 has the higher valuation, and the index

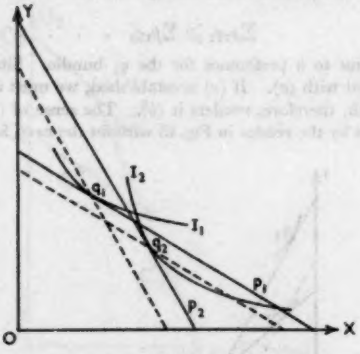

FIG. iv

numbers give us (*c*). This situation corresponds to the non-fulfilment of the Kaldor–Hicks test, inasmuch as q_2 is not preferred to q_1, when the comparison between bundles is based on the I_1 welfare distribution.

Indeed, if we think now in terms of the Samuelson criterion, which requires that we compare q_2 and q_1 for all conceivable distributions of welfare, and, therefore, for an implied range of corresponding price ratios, q_2 is potentially superior to q_1 only if, for all such price ratios, q_2 costs as much or more than q_1. Again, a sufficient condition for this to occur is that the q_2 bundle contain more of "every" good than q_1.

[1] Samuelson [221] refers to it as the *situation* utility-possibility curve in order to distinguish it from the *point* utility curve of a bundle of goods.

It may be supposed that all welfare distributions on and within the boundary of Fig. 9 can be reached by government policies or, if we wish to appear realists, we can follow Samuelson and include only "feasible" welfare combinations in the picture. The set of W curves in the figure emerges from some acceptable social-welfare function, each such curve being a locus of welfare combinations as between which society is indifferent.[1] If

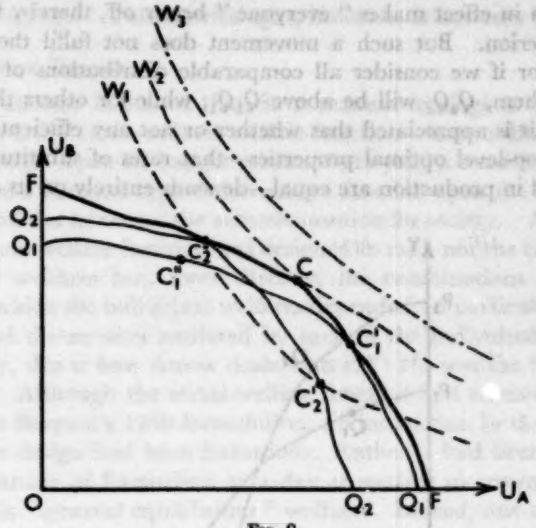

FIG. 9

the social-welfare function is "of the Paretian type," to use Graaff's terminology, the W's are ranked north-east from the origin; which is to say, if "everyone" is better off, then society is deemed to be better off—an ethical judgment that seems to have met with little opposition. C in Fig. 9 is clearly the maximum social welfare for the particular Paretian type of social-welfare function chosen: of all the welfare combinations open to society that at C has, in the opinions formalised by the welfare function, the highest social value.

Disregarding, provisionally, the social-welfare function, let us briefly explore the properties of the utility frontier. The point c_1', as the tangency between Q_1Q_1 and the frontier FF, informs us that there is no distribution of any other bundle that can yield a situation in which "everyone" is better off than he is at c_1'. Since on this description c_1' is recognised as a Pareto optimum, all the necessary conditions—the exchange, production and top-level optima—are all fulfilled. Indeed, since the utility frontier is made up

[1] The reader is reminded that we have yet to determine whether a social-welfare function for society can emerge from the separate aspirations of the individuals comprising it.

of tangency points such as c_1', this frontier constitutes a locus of Paretian optima.

A welfare combination c_1'' on the utility-possibility curve Q_1Q_1 is obviously not a Pareto optimum, being a point below the frontier *FF*. Exchange optimum obtains and we must assume—if *FF* is a genuine frontier —that production optimum also obtains. Top-level optimum, however, does not obtain, since a movement from c_1'' to, say, c_2'' involves a change of bundle which in effect makes " everyone " better off, thereby fulfilling the Paretian criterion. But such a movement does not fulfil the Samuelson criterion. For if we consider all comparable distributions of Q_1 and Q_2, for some of them, Q_2Q_2 will be above Q_1Q_1, while for others the reverse is true. Once it is appreciated that whether or not any efficiently produced bundle has top-level optimal properties—that rates of substitution in consumption and in production are equal—depends entirely on its distribution,

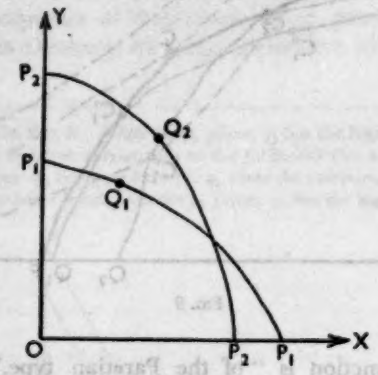

FIG. 10

any belief in the potential superiority of a Pareto optimum disappears. Any Pareto optimum will, of course, be actually superior to some particular range of comparable non-optimal positions. But since the optimal characteristic of a bundle depends solely on the distribution attaching to it, divested of that distribution it fares no better than the other efficiently produced bundles. No bundle, then, is superior to any one of the other efficiently produced bundles for *all* welfare distributions, and therefore no bundle can fulfil the Samuelson criterion.[1]

If Q_1 and Q_2, in Fig. 10, are regarded as bundles of goods on alternative

[1] A similar treatment using community indifference curves can be found in [180], where it is shown that as optimal and non-optimal positions are characterised, at top level, by the relationship between prices and their marginal costs, comparisons between such positions cannot even be made. Only when such a range of bundles (on the production-possibility curve) are divested of their optimal or non-optimal characteristics can comparisons between them be made and, in the absence of a particular welfare distribution, no bundle can be demonstrated superior to any other.

production-possibility curves P_1P_1 and P_2P_2 respectively [1] we run into trouble according to Samuelson. For though the utility-possibility curve generated from bundle Q_2 lies everywhere above that generated from bundle Q_1, obviously the utility frontier of the production-possibility curve P_2P_2 will not lie everywhere above that of P_1P_1. If, now, the community experiences a shift from Q_1 on P_1P_1 to Q_2 on P_2P_2, producing more of all goods in the new position, the inference that a potential increase of real income has taken place would be false. This afterthought, however, is not very convincing.[2]

The Social-welfare Function

We have already indicated that, in a manner analogous with the imposition of an individual's ordinal welfare function—in two dimensions, his indifference map—upon his budget constraint, to yield a maximum position, we can impose a Paretian-type social-welfare function upon the boundary of welfare possibilities to reveal the summit position for society. Actually, the original Bergson welfare function was designed to rank not the combinations of individual welfares but, more directly, the combinations of all those variables on which the individual welfares depended, in particular the goods consumed and the services rendered by each of the individuals in society. And, formally, this is how Arrow deals with it.[3] He was the first to make the attempt. Although the social-welfare function had received continual mention since Bergson's 1938 formulation, no instruction in the drafting of this grandiose design had been hazarded. Rather it had been invoked in the grand manner of Samuelson as a *deus ex machina* to crown the formal elegance of his "general equilibrium" welfare. Indeed, one could hardly hope to do more with so stupendous a concept—except, perhaps, to question whether such a thing could, in principle, be constructed so as to manifest the aspirations of a free society. This, in fact, was the task that Arrow set himself.

We are to imagine that each individual has his own precise notion of a

[1] The meaning to be attached to a choice between alternative production frontiers is far from obvious. Other than international trade, which presents the community with alternative *consumption* possibilities, one expects, with the passage of time, that the entire production frontier move outward. The choice of accumulating at a faster rate, then, translates into the choice of having the entire frontier move outward at a faster rate.

Even if, owing to the exhaustion of irreplaceable resources, some parts of the frontier shrink, the event is, surely, irreversible.

[2] The sense of the word "potential" in this context is elusive. In the original Kaldor–Hicks criterion the statement that Q_2 is potentially superior to Q_1 would mean that a *redistribution* of the product Q_2 would make "everyone" better off. Pending the actual redistribution, that is, the superiority of Q_2 remains potential. But what of the assertion that a production-possibility curve P_2P_2 is potentially superior to P_1P_1, since, for any point on P_1P_1, there will be some point on P_2P_2 with more of "every" good? For not only is hypothetical distribution involved in this case but also hypothetical movements along the production-possibility curves. But if one can envisage movements from bundle to bundle along the curves, why not also between the curves? If such movements are admitted, however, as it seems they should, the comparison between the two production-possibility curves crumbles. Only the outer production frontier has meaning.

[3] See bibliography, item 14.

suitable welfare function for society or, to use Arrow's terminology, that each individual has a particular "ordering," or ranking, of all the conceivable "social states"—each "social state" referring to a distinct combination of all the relevant variables in the economy that enter into the individual's welfare.[1] Suppose there are m distinct social states conceivable, and suppose that there are altogether n different ways of ordering these m social states,[2] the question to be answered is: regardless of which of these n different ways happens to be chosen by each of the individuals, will it be possible, always, by means of some rules that are ethically acceptable to a free society, to construct therefrom a corresponding social ordering of the m social states?

In order to be ethically acceptable, Arrow proposes that the social ordering to be derived from the individual orderings meet certain "reasonable" conditions: (i) it must be positively associated with the individual orderings;[3] (ii) if some social state be removed, as no longer relevant, society's ranking of the remaining social states must not be changed; (iii) the social ordering must not be imposed, either by custom or dictatorship.

After dismissing the rank-order method of voting,[4] and after a preliminary skirmish with the compensation principle,[5] Arrow opens a full-scale attack with his "Possibility Theorem" designed to demonstrate the impossibility of meeting these conditions.

Though the problem has been posed on an astronomical scale, the proof is compact enough, involving, in the first instance, only two individuals and three alternative social states, x, y, z. Since among Arrow's axioms is the requirement that for every conceivable set of individual orderings there must correspond a distinct ordering for society, in the event that individual I prefers x to y and individual II y to x, we are obliged to infer that society is "indifferent" as between y and x. To state otherwise, for instance, that society prefers x to y, leads to logical implications which reveal individual I to be a dictator inasmuch as society's orderings will always coincide with his.

If, now, to take an awkward possibility, individual I has the ordering x, y, z, and II has the ordering z, x, y, we are required to infer, as just stated,

[1] Although it is allowed that the welfare of each individual may depend on those of others, inasmuch as the goods received and services rendered by every individual enter into the social states to be ranked, the formal treatment at no point draws on this complication.

[2] If we admit only "strong" ordering—no provision for indifference being made—m alternative social states can be ranked in m factorial different ways. The introduction of "weak" ordering—indifference being allowed—multiplies this number.

[3] This condition would exclude inter-personal comparisons of utility.

[4] See bibliography, item 14, p. 27.

[5] Since Arrow's rejection of the compensation principle on the grounds of inconsistency [14, pp. 34–45] stems from his adoption of a footnote suggestion by Scitovsky [228, pp. 94–5] that two bundles of goods whose community indifference curves intersect be regarded as "equally good," his demonstration is, perhaps, otiose. If anything, the principle of compensation cannot qualify for a social-welfare function meeting Arrow's conditions simply because of Arrow's axiom that for *all* alternative social states a social ordering must be derived, whereas it is generally acknowledged—notwithstanding Scitovsky's (unguarded?) proposal—that cases arise for which the compensation test gives an ambiguous answer, an answer which precludes judgment and prescription.

that society is indifferent as between y and z. In addition, for both individuals, and therefore for society also, x is preferred to y. From which it follows—using Arrow's transitivity axiom—that, for society, x is preferred to z. But, since I prefers x to z, and II prefers z to x, we are bound to conclude, also, that society is indifferent as between x and z, which contradicts the conclusion of the previous sentence.[1]

Arrow concludes that, in general, a rule for passing from individual orderings to a social ordering consistent with his "reasonable" conditions cannot be found. Consistency would require an imposed or a dictated social-welfare function.

While the formal lay-out of Arrow's argument was impressive, it would not be unfair to suggest that the conclusion was hardly surprising. One does not have to venture beyond a vision of two stubborn men on an island with mutually opposite ideas about the proper division of labour, and the fruits thereof, to run into an impasse of this sort. Notwithstanding this opinion, Arrow's thesis caused some stir in academic circles. Several papers were published, productive more of symbols than of substance, urging modifications of Arrow's conditions in the attempt to keep the social-welfare function from expiring.[2] But even if Arrow had proved that, in principle, a completely satisfactory transition from any set of individual orderings to an ordering for society was always possible, the route to the (continually changing) position of maximum social welfare would have been too arduous for the most accomplished econometrician to plot, to say nothing of prompting humanity to undertake the journey.

Summing up, there are three main ways of regarding compensation tests:

(1) As sufficient conditions for prescribing a change to a new position by defining such tests as tests of "efficiency." It is doubtful if anyone holds this view today—or ever did without some qualification. If, however, it were adopted, and one aimed at a test which was to detach itself from any particular distribution, contradiction could be avoided only by espousing the Samuelson criterion. In view of the virtually infinite number of welfare distributions, such a criterion is not a practical proposition. But for the one situation in which the criterion is always satisfied—that in which one of the bundles has more of "every" good than the other—no such test is necessary.

(2) Once proposed, the Samuelson criterion—requiring that the

[1] What this contradiction seems to reveal is that the "social indifference" arbitrarily—though in view of Arrow's axioms, necessarily—attributed to an opposition of values between individuals is not transitive, as we might well suspect.

[2] Hildreth [106] argues that if one individual barely prefers x to y while another desperately prefers y to x, the social choice should rank y above x. J. C. Wheldon [246] also considers bringing in inter-personal comparisons of welfare, as do Kemp and Asimakopulos [129], who further propose a "constitution" which entails measurable utility. Inada [113] proposes a less-severe set of conditions which lead also to the Arrow result.

Other contributions, such as those of Little [162], Rothenberg [213] and Buchanan [44], are of a more philosophical nature.

utility-possibility curve of one bundle be at all points outside that of the other—lent itself to the idea of an envelope of such curves, or a utility frontier encompassing all welfare possibilities latent in the resources at the disposal of the community. Each of the welfare combinations on the frontier corresponds to a position of Pareto optimum, but without some expressed partiality for one distribution of welfare over all others there is no acceptable case in welfare economics for prescribing a movement from a non-optimal position to any optimal position.[1] On the other hand, the formation of a "satisfactory" social-welfare function in order to determine a unique position of maximum social welfare is not only utopian, it is in principle impossible.

(3) Returning to earth again, we may accept compensation tests but only as necessary conditions for policy prescription. For instance, in Little's piecemeal approach, if the Kaldor–Hicks and/or the "Scitovsky criterion" are fulfilled, then a movement to the new position is recommended provided, however, that redistribution is acceptable.

IV. Consumers' Surplus

One can readily sympathise with the high hopes originally entertained by Marshall for his doctrine of consumers' surplus as an instrument of social betterment. His definition of the individual consumer's surplus—the amount a man is willing to pay rather than go without the thing, over the amount he has to pay—had so immediate an appeal to subjective experience that, despite severe criticism of the doctrine and Marshall's own eventual loss of faith in it, the prospect of its extension as a practical tool of welfare analysis has tempted the ingenuity of several eminent economists, among whom the best known is Professor J. R. Hicks. In his *Value and Capital* consumer's surplus appeared as a by-product of his ordinal treatment of the theory of consumer's behaviour. In this more acceptable ordinal form it was further refined and developed in a series of papers appearing in *The Review of Economic Studies* in the early forties.[2] The substance of these papers, along with some further reflections, may be found in his recent *Revision of Demand Theory*.

Myint, in his 1948 book,[3] champions the consumers' surplus technique as against the marginalism of Pigou. The marginal conditions, he contends, permit only of small adjustments within the neighbourhood of the existing pattern of output. In contrast, consumers' surplus enables us to meet the Hicksian total conditions which encompass all ranges of output and, indeed, enables us to determine whether or not any particular good should be abandoned or a new one introduced. Again, it is frequently pointed out

[1] It may be stressed, however, that if society is not already at an optimum position there is scope for making "everyone" better off.

[2] See bibliography, items 100–103.

[3] See bibliography, item 189.

that the marginal conditions are inappropriate for goods that are insufficiently divisible to enable the consumer to equate the value of the good to him with its market price. In such cases the value of the " marginal " unit —which may be the only unit purchased—might greatly exceed the price. So much at least may be said in favour of the technique of consumers' surplus. What of the criticisms? Before we consider them, however, and Hicks' attempts to meet them, let us glance briefly at the various definitions proposed.

In the course of defining consumer's surplus in terms of money income in *Value and Capital*, Hicks suggested that the notion was akin to a compensated variation in income. The definition used in this connection was, soon after, shown by Henderson to differ from the original Marshallian definition,[1] the difference turning on the quantity of the good purchased. Marshall's definition corresponded to the sum of money that the consumer was prepared to pay for the privilege of being able to buy at the existing price *the amount that he was already buying at that price*. On the other hand, Hicks' definition concerned the sum he was prepared to pay for the privilege of being able to buy the good at the existing price *in whatsoever quantities he wished*.[2] Inasmuch, then, as Marshall's definition involved a quantitative constraint, absent in the Hicks definition, the maximum sum of money that the consumer would be prepared to pay would be smaller under the former definition than under the latter.

In the same paper Henderson pointed to a further ambiguity: the

[1] See bibliography, item 93.

[2] Using Henderson's diagram on which Fig. v is based, the Marshallian consumer's surplus

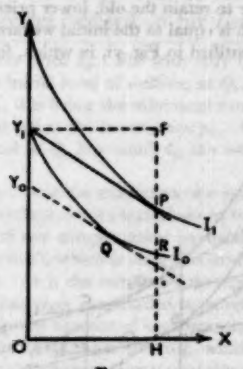

FIG. v

is equal to *PR*. For if he were obliged to spend *FR* in buying *OH* of *X* he would be just as well off as if *X* were not available, whereas in fact he has to spend only *FP*. Hicks' compensating variation, however, is Y_1Y_0. For if the consumer is made to pay this much in order to retain the price *P* he will just reach *Q* on the indifference curve I_0, his initial welfare position in the absence of a price for *X*.

Note, that since the issue in these earlier illustrations was whether to introduce *X* at a given price or not to introduce *X* at all, an all-or-nothing offer confronted the consumer.

compensating variation measure proposed by Hicks would differ according to whether the consumer had to *pay* for the opportunity to buy the new good X, or whether he was to *be paid* for abandoning the purchase of X. The same distinction clearly held if the choice was that between buying X at a lower price or at a higher price.

In reply, Hicks [1] carefully traced a relationship between four definitions of consumer's surplus and the Marshallian measure—the area under the individual's demand curve. The scheme required some new terminology in order to effect a double distinction: (*a*) that between the compensating variation (CV), for either a fall or rise in price, which compensation when paid or received is such as to leave the consumer in his *initial* welfare position, on the one hand, and, on the other, the equivalent variation (EV), again for a rise or fall in price, which involves compensation, paid or received, such as to leave him in the *subsequent* welfare position following the change of price,[2] and (*b*) that between the *price* compensating variation (CV_p), or *price* equivalent variation (EV_p), on the one hand, which covers those cases for which the individual is free to choose the quantity of the good in question, and, on the other hand, the *quantity* compensating variation (CV_q), or the *quantity* equivalent variation (EV_q), to cover those cases in which—like the original Marshall definition—the consumer is restricted to the quantity purchased in the absence of compensation.[3]

[1] See bibliography, item 102.

[2] It follows, as Hicks points out, that (1) the CV of a *fall* in price from p_1 to p_2 (the maximum payment by the individual in order to have the new, lower, price p_2, which payment leaves him at his *initial* welfare) is exactly equal to (2) the EV of a *rise* in price from p_2 to p_1 (the maximum payment by the individual in order to retain the old, lower price p_2, which payment leaves him at a new, lower level of welfare, which is equal to the initial welfare in (1)).

[3] These four definitions are identified in Fig. vi, in which, for brevity, we consider consumer's

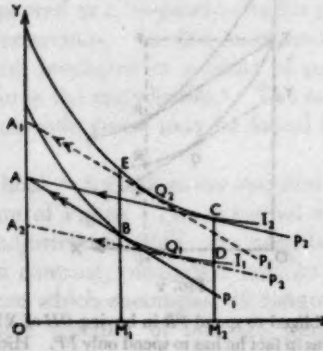

FIG. vi

surpluses only for a fall in price from p_1 to p_2, the income of the individual—equal to all other goods at fixed prices—being measured as OA.

The CV_p is measured as AA_2, this being the maximum income the consumer will pay for the

There is no analytical difficulty in extending these four definitions to simultaneous changes in the prices of many goods.[1] Indeed, they can be extended to cover not only all goods bought on the market but also all factors sold by the individual to the market, thereby involving rent in the same fourfold distinction.[2] In the absence of income effects, all these measures coincide, though in any case the differences between them are thought not to be important for practical measurement.

We are now faced with the rather more difficult task of making the transition from the individual to the community. Hicks attempts this by abandoning Marshall's assumptions about constant market shares and so forth, arising from his cardinal view of utility, as implausible and unnecessary. Without bothering our heads over inter-personal comparisons, if the area between the demand curve and the price is taken as a good approximation of the sum of the individual consumers' surpluses, however defined,[3] and if the area between the supply curve and the price[4] is taken to be a good approximation of the sum of the relevant producers' surpluses, however defined, we may add these areas algebraically as sums of money. If both areas are positive, or if the positive consumers' surplus exceeds the negative producers' surplus (in the case of decreasing average cost), the compensation principle provides a rationale for undertaking the investment in the good in question—or for retaining it if it is already in production. At least it does this if all the gains and losses to the community from the production of this good are summarised in this partial picture given by the market demand and supply curve. In general, this will not be the case. Problems arise when we trace out the effects in the rest of the economy, and it is to such problems that Hicks addresses himself in his *Rehabilitation* paper of 1943.[5]

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privilege of buying X at the lower price p_2. For with only OA_2 of his income left, he can move along A_2p_2 and just touch I_1, his initial level of welfare, at Q_1.

The EV_p is measured by AA_1, this being the minimum sum which the consumer will accept to relinquish the opportunity of buying at the lower price p_2. With this compensation and the old price he can move along A_1p_1 and at Q_2 just touch I_2, the welfare level he would reach if he did not relinquish p_2.

The CV_q is measured by CD. It is the maximum the consumer will pay for the privilege of buying at p_2 if, along with this privilege, he is constrained to buy OM_2 of X, the quantity which he would buy at p_2 in the absence of any compensating payments. Thus, if he buys OM_2 at p_2, he gets to C. He pays CD and gets to D, which is on I_1, his initial level of welfare.

The EV_q is measured by EB. It is the minimum the consumer will accept to return to the higher price p_1, if he is at the same time constrained to purchase OM_1, the quantity of X which in fact he would consume at p_1 in the absence of compensation receipts. Thus, consuming OM_1 at p_1 places him at B. The receipt of BE takes him to E, which is on I_2, the higher level of welfare he could have reached with p_2 in the absence of any quantity constraint.

It has been argued [179] that in all plausible circumstances we should consider using only CV_p and EV_p.

[1] Hicks, in his generalisation of consumer's surplus [101], expresses them in terms of Paasche or Laspeyres variations plus income and/or substitution effects.

[2] See bibliography, item 182.

[3] For most purposes, the CV_p definition is appropriate.

[4] Where the supply curve is above the price the producers' surplus is taken to be negative.

[5] See bibliography, item 100.

If over the whole economy competition was perfect, and there was a complete absence of external economies and diseconomies, no apparent difficulty arises. The prices of the factors attracted to the new project reflect their values at the margin in all other uses. If, however, prices exceed their corresponding marginal costs in other industries the values of the factors which move into the new project exceed their prices and, therefore, their cost to the new project. Since the opportunity cost of these factors to society exceeds their cost to the new project, some correction is called for and may be administered by raising the apparent marginal cost of the product under consideration by the appropriate percentage prior to measuring the net surplus. If this corrected net surplus, or social surplus, is positive the good should be introduced, and in the amount which makes the corrected marginal cost equal to price, notwithstanding that the commercial criterion, that of a positive producers' surplus, is not met.[1]

This treatment does not, however, face up to the chief difficulties. Even within its own limited terms of reference, it does not answer the rather obvious question of what to do when some of the factors to be used in the new good X come from industries whose prices exceed their marginal costs in varying degrees, while others come from industries whose prices fall below their marginal costs, again in varying degrees. In principle, of course, there

[1] The question of whether we are not double counting by adding together consumers' and producers' surpluses deserves some attention if only because of Marshall's warning in appendix K of the *Principles*. Obviously the issue turns on the meaning of producers' surplus. In the *Principles* it is used as a synonym for rents (not profits), which have been defined recently [182] in a manner symmetrical in all respects with consumer's surplus—as the *CV* or *EV* to the individual arising from changes in the prices of the factors that he sells to the market.

In an n-dimensional figure containing both goods' axes and factors' axes, we can regard the individual as both a consumer of goods, measuring the welfare effect of a change in the prices of goods along the goods' axes, and as a supplier of factors, measuring the welfare effect of a change in the prices of factors along the factors' axes. In principle, however, the welfare of all such price changes may be measured along any one, or any several, of the axes. After all, the net effect of any group of price changes is to place the individual on a higher, or lower, indifference surface, the difference between which and the initial indifference surface, being measurable along any one (or several) of the axes, as a *CV* or *EV*.

On a partial view, however, and thinking in terms of individual demand curves, we could add together the consumer's surplus arising from a decline in a group of product prices in the manner suggested by Hicks [99]—the *ceteris paribus* on successive goods, to include the lowered prices of goods whose consumer's surplus has already been measured. Alternatively, this same decline in a group of product prices could be regarded as giving rise to an increase in rent, or producer's surplus, for the individual, inasmuch as a fall in the price of any product he consumes is *pro tanto* a rise in his real income, or welfare. Now, the addition of an improvement in welfare of this sort, first as a consumer's surplus and then again in the guise of a producer's surplus, is obviously wrong. But this does not mean that there may not be some practical convenience in dividing a given gain of welfare into two parts: a part arising from changes in product prices and a part arising from changes in factor prices. An individual whose factors are attracted into the production of X and who, in addition, is enabled to purchase X at a lower price does in fact gain from both these circumstances. Therefore the total gain which places him on a higher indifference surface and which is, as suggested above, measurable in principle on any one of the axes, is, on this partial approach, split into a measure of the gain from the lower product prices plus a measure of the gain from the higher factor prices, which two measures add together to yield a measure of the total gain in welfare.

is little difficulty: we can value each factor to be used at the value it contributes elsewhere. But we have to abandon any simple practical rule, such as raising or lowering the cost curve of the industry in question.

Many of the chief difficulties in taking account of the repercussions in the rest of the economy are mentioned by Little,[1] whose main conclusions may be summarised as follows: the case for which Hicks' treatment is valid is that for which the introduction of a new good, X, affects only to a negligible extent each of the outputs of all other goods in the economy. However, cases in which other goods, say Y and Z, are closely related to X in consumption are more common. Suppose, for example, that Y and Z are close substitutes for X, and that everywhere price is equal to marginal cost. Now if both Y and Z are produced under constant costs there is little trouble. The area under the demand curve for X is then a measure of the consumers' surplus which meets the *cet. par.* requirement that all other prices be constant, and, in so far as the introduction of X causes consumers to switch from Y and Z to buying X, they are—for all intra-marginal units—made better off, the area between the demand curve for X and its price being a measure of their gain.[2] Since the assumption of constant costs ensures that no losses of producers' surplus take place in Y and Z, there is no need to correct the producers' surplus in X. Obviously, however, if price exceeded marginal cost in Y and Z the supply curve of X would have to be raised for reasons given above.

In the event, however, that Y and Z are not constant-cost industries difficulties begin to mount. Suppose they are increasing-cost industries, the consequent consumers' surplus in X measured in the usual way will be an underestimate. For in so far as the shift of output from industries Y and Z reduces their prices, when X is introduced, consumers are better off than if, as in the previous case, their prices remain constant. Yet the consequence of a decline in the prices of Y and Z is to reduce this shift of demand from Y and Z to good X, thereby, of course, reducing the area of consumers' surplus in X, notwithstanding the additional benefits accruing to consumers in this case as compared with the previous case. On the other hand, against any gain of producers' surplus in X must be set losses of producers' surplus in Y and Z. However, producers' surpluses are difficult things to measure, involving as they do the rents of all factors whose prices or occupations are changed as a result of introducing X. Profits, which are more closely identified with the area between the price and the supply curve, afford little clue to the magnitudes involved. Even in the special case above, we must be prepared for a rise in the prices of some factors, a fall in the prices of

[1] See bibliography, item 161, Chapter 10.

[2] True, in so far as demand has shifted from Y and Z to X, the areas under the demand curves for Y and Z have shrunk. But this can be legitimately ignored, for no consumer can be worse off when Y and Z are available at the same price as before, and X is now cheaper (or newly available). In other words, the *cet. par.* being met in the measurement of the consumer's surplus in X, no further correction need be allowed for.

others, both groups of factors being found in many industries besides those of X, Y and Z.

Though we have said nothing yet of divergences between private and social valuation, they require the same sort of correction as discrepancies in the ratios of prices to marginal costs. There is, however, still the familiar and inescapable difficulty arising out of the interdependence of valuation and distribution: in making the transition from the individual to the community, that is, we cannot escape the complication uncovered in Part III. Here, as there, only the Samuelson criterion can serve us without fear of contradiction for all criteria in which distributive considerations are to be set aside.

In order to separate this source of complication from that arising from closely related goods with increasing costs, let us suppose again that all goods other than X are produced under constant costs. The area enclosed between the demand curve for X and the price is a rough approximation to the sum of the individual consumers' CV_p given the existing distribution of welfare, prior to the introduction of X. The area between the supply curve and the price is yet a cruder approximation to the sum of the factor-owners' CV_p at the given welfare distribution. The algebraic sum of all individuals CV_p, regarded as consumers and as suppliers of factors, is therefore approximately represented by the area enclosed between the demand curve and the corrected supply curve.[1] Crude as this area is as an index of net gain in welfare arising from the introduction of X when all other goods are produced at constant costs, we are required by the Samuelson criterion to measure this social surplus for all conceivable welfare distributions. If for any welfare distribution this area of surplus is negative, there is no warrant, on grounds of "efficiency"—on the Samuelson criterion alone—for introducing X. On Little's approach, however, provided that we approve of the distribution which accompanies the production of X, we should introduce X if the social surplus is large enough to assure us that the sum of the CV_p must be positive. If it is positive, the Kaldor–Hicks criterion is met: with the old distribution (prior to the introduction of X) "everyone" can be made better off by producing X.

In sum, then, as a method of capturing data on which to exercise the compensation tests, consumers' and producers' surpluses suffer not only from the distributional complications common to comparisons based on such tests but also from difficulties in their measurement, largely owing to their essentially partial character. In view of this, one can sympathise with

[1] It is sometimes proposed that the sum of the *CV*'s should exceed the sum of the *EV*'s. But on Hicks' definition, if a price moves in favour of an individual the maximum he is prepared to pay for that price is the *CV*, while if the price moves against him the *CV* becomes the minimum he must receive in order not to be worse off than before. The gainers can therefore compensate the losers if the sum of all their *CV*'s is positive.

The sense of this definition is further illustrated in the special case of an individual whose gain as a consumer exactly offsets his loss as a supplier of factors, his net *CV* being nil.

Little's comment that consumers' surplus is but a theoretical toy,[1] though it is putting the case a little too strongly. After all, what other practical procedures are open to us in a comparison of two situations?

V. Some Recent Obstacles

In order not to clutter up the main features in the developments over the last twenty years, we have set aside for separate treatment in this section a number of considerations, all of which appear, on the surface of things, to reduce the applicability of welfare economics.

Second Best Optima

The recent paper by Lipsey and Lancaster [2] was the culmination of a diversity of contributions [3] which sought ways of approaching a next best solution whenever some particular institutional or policy constraint prevented the realisation of all the conditions necessary for a true summit position. A common conclusion, albeit a negative one, was implicit in all these writings; namely, that if one or more of the optimum conditions could not, in the circumstances, be met in one or more of the sectors of the economy, one did not make the best of a bad job by proceeding blithely to fulfil the remaining conditions. To illustrate with a familiar problem; the determination of the output of a particular industry when it is known that in all other industries price exceeds marginal cost. Rather than equate marginal cost to price in this particular industry, we should choose an output for which price here, as elsewhere, exceeds marginal cost.[4] The new rule in this case is, of course, simple and obvious. If, however, some of the other industries were perfectly competitive, some monopolistic and others subsidised there may not be a satisfactory second-best solution at all, and, if there is, the rules to be adopted may be far from simple.

A theorem embodying this negative conclusion is proved elegantly by the simple mathematics of maximising a function of n variables subject to the usual constraints—such as the production function—*plus* an "artificial" constraint in the form of an *inequality* of one of the conventional marginal conditions. The first-order conditions resulting from this operation are not identifiable as the usual marginal conditions for an optimum but are relatively complex expressions. Indeed, without knowledge of the specific forms of the welfare and production functions we should, in general, be unable to translate such expression even in qualitative terms—we should be

[1] See bibliography, item 161, p. 180.

[2] See bibliography, item 141.

[3] Some examples of the application of second best theory may be found in Jacob Viner's *The Customs Union Issue* (1950); S. A. Ozga, "An Essay in the Theory of Tariffs," *Journal of Political Economy*, 1955; J. E. Meade, *The Theory of Customs Unions* (1955), also [172], [51] and [155].

[4] See R. F. Kahn, "Some Notes on Ideal Output," and the discussion in Part II. It is assumed, in this example, that the supply curves of all factors are of zero elasticity.

quite unable to say, for instance, that in regard to, say, a good *Y* the price should be greater, equal or less than its marginal cost.[1]

Though no logical difficulties arise in placing this theorem within the body of welfare analysis, it does seem, at first blush, to reduce drastically the applicability of such analysis. For it is too much to hope that welfare economists will be operating in an environment subject to no policy or institutional restraints. And it requires only that in one sector the conventional optimum conditions be abandoned as impracticable for the conventional optimum conditions to be irrelevant in the remaining sectors.

Interdependent Utilities

Though recognition of the effect on the individual's welfare of the possessions of others is not new in the literature, Duesenberry was the first to invest the idea with some formal analysis and to deduce therefrom some implications for welfare economics.[2] He attacks the problem by supposing a community of three people, each of whose welfare depends not only on his own income but also on those of the other two.[3] This interdependence, in effect, imposes additional constraints, so that the first-order condition of a maximum position for each individual is more complex than the usual one. Whereas with independent utilities the individual equates his (subjective) rate of substitution between product and factor to the marginal physical product, there are now, with interdependence, additional terms in the condition so as to take account of the welfare effect upon others of the addition to his welfare. Thus, translating into value terms, if the value of the marginal product were equal to one pound the supply of the additional factors provided is not justified if it merely compensated the individual for the sacrifice involved. The one pound must, in addition, compensate others who are—let us assume—adversely affected by his one pound of additional income. Indeed, it must be enough to cover the effects of all subsequent adjustments to his own and to their incomes. If, of course, instead, the effects on others are beneficial, inasmuch as they rejoice in each other's good fortune, symmetrical reasoning shows that—since each individual in his own adjustment ignores the benefits he confers on others—the application of the conventional factor-product rule results in an output below the true optimum. In such situations no specific rules can be laid down without specific knowledge of the nature of the interdependence.

[1] Though the theory was not generalised to cover a community, the conclusion is applicable to the community. Thus, following the recognition of one or more policy constraints, pursuit of the remaining optimum conditions will not direct us to a point on the second-best utility frontier —a position, that is, in which, accepting the constraints, it is impossible to make "everyone" better off. To reach this second-best frontier, the familiar marginal equalities must give way to other more complex ones.

[2] See bibliography, item 60.

[3] Duesenberry simplifies further by assuming only one good and only one factor. But the results he reaches are sufficiently general for the purpose in hand.

An interesting idea emerges from this analysis. Imagine, says Duesenberry, that, on balance, each income group is adversely affected by the income groups above but not by those below it, then a progressive income tax [1] would be a corrective in the right direction. Ideally, of course, the tax should suffice to cover all the initial and subsequent claims necessary to placate everybody in the lower-income groups, and the stronger is this envy of others,[2] the heavier must be the tax. In this connection the term "excessive" [3] is used to indicate a circumstance in which any net increase of output—for instance, more of "every" good without additional effort—will not advance the welfare of the community no matter how it is distributed. Indeed, any increase of output makes the community worse off, since, no matter how the additional goods are distributed, the additional envy generated cannot be adequately compensated out of these extra goods.[4]

However, if the community were in so unfortunate a position, symmetrical reasoning would surely point to the possibility of improvement through a reduction of output. Empirical confirmation of the existence of excess envy does not therefore constitute a valid objection to the application of welfare analysis,[5] though the more complex conditions of substitution between factor and product are likely to involve guesswork rather than measurement, to

[1] No reason is given why the tax should be progressive as distinct, say, from a proportional income tax.

[2] Envy of the possessions of others is frequently referred to, or classified under, "external diseconomies of consumption." But such terminology seems more appropriate to the tangible and, in principle, measurable effects on other people's enjoyment and convenience of the use by others of consumer goods. Such by-products as air pollution, noise, mutual hindrance and litter are obvious examples.

[3] See bibliography, item 84, p. 51.

[4] One might imagine that the existence of "altruistic" interdependence (enjoying others' good fortune) adds to the community's welfare while "egoistical" interdependence (resenting others' good fortune) reduces it, but this is not so. If I am made happy by the thought of those with higher incomes, or advancing incomes, I must be saddened reflecting on those with lower incomes, or declining incomes. If, on the other hand, I suffer mortification contemplating higher incomes, or advancing incomes, I shall feel triumphant in my own progress relative to that of others. How much and in what way a person's welfare is affected by either sort of interdependence obviously depends on his age, his nature, his environment, his movement and position along the income scale, etc., there being no *a priori* reason to suppose that on balance his welfare is increased or reduced by either sort of interdependence. I owe appreciation of this point to Sir Roy Harrod.

Nevertheless, the argument that the application of the conventional factor-product condition results in too small an output in the case of altruistic interdependence and too large an output in the case of egoistical interpendence still holds. For the individual properly takes all his own feelings into account when adjusting the supply of his factors to their prices, but does not take into account the pleasures or pains experienced by others in the community whose welfares are affected by the size of his income.

[5] Though no formal development is undertaken here, it may be noted in passing that differences in the degree of envy experienced do not disturb this conclusion. We can easily see this by contemplating a situation prior to which the community's mutual envy is not such as to warrant any check on output. Thus we may imagine output to increase along with improvements in technology, this being permitted provided the additional product suffices to reward any additional factors involved and to placate additional envy generated. The additional envy may issue chiefly from one or a group of persons. Increased output is warranted, however, only so long as this additional envy, no matter how distributed, can be more than compensated out of the increase. Symmetrical reasoning applies to differences in degree of altruistic interdependence.

say nothing of the political difficulty of a decision to reduce total output in order to restore a position of optimum.

What of the other marginal conditions of optimum? The general belief seems to be that a true optimum would require their modification also. But if excessive envy has been ruled out on the previous argument as evidence only of a failure of the true factor-product conditions, a failure which results in an output larger than optimum, the belief seems mistaken. Consider a movement from a position where initially there was a discrepancy of the factor rates of substitution as between one good and another to a position in which the factor rates of substitution were the same for the two goods. Since additional goods are made available without additional effort, there is some distribution of the additional goods which will—despite the existence of some (not " excessive ") envy—make " everyone " better off. Top-level optimum remains unmodified for the same sort of reason: if the relevant community indifference curve cuts the transformation curve there must exist a range of output possibilities for which " everyone " can be made better off. Finally, the exchange optimum, requiring the rate of substitution between all pairs of goods be the same for each individual, survives for similar reasons.[1]

Dynamics

No body of formal dynamic welfare analysis comparable with that of static welfare analysis exists. Reder made a modest attempt to erect some stylised structure in the shape of an extension of the optimum conditions to risk-bearing and the like,[2] but the concepts, even in principle, were scarcely

[1] By considering the effect on an individual's welfare of the consumption by another of particular goods, Henderson and Quandt [92] have concluded otherwise. They use two arguments: (1) In a model containing two individuals, each of whose utility function depends upon his own consumption and that of the other, the utility of one of them is maximised subject to a given utility of the other. The resulting expression differs from the familiar one (deriving from independent utilities) by having the ratio of the marginal utilities (to be equated to the price ratio) modified to take account of the losses or gains in the utility accruing as a consequence of the other's possession of the two goods. The interpretation placed on this mathematical expression by the authors is that the equality of rates of substitution is no longer the optimal condition. All that emerges, however, is that in the presence of interdependence the old formula no longer holds. It does not mean that the *ratio* of the modified marginal utilities are not, in equilibrium, equal.

(2) A graphical illustration in which, with an individual's indifference map drawn on the assumption of independence, the introduction of considerations resting on interdependence moves the individual from his initial (independent) optimum. This obviously will not do. In the two-good, two-person case, in which every combination chosen by one determines the combination of goods left to the other, each individual ranks every point in the box diagram according to the balance of advantage experienced—taking into account his response to the other's possessions—thereby generating a consistent ranking of his indifference curves. An optimum position under these conditions has the usual optimal property. In general, then, regardless of what goes into the individual utility functions, if rates of substitution between any two individuals differ, mutually advantageous exchange—provided the utility functions remain unchanged—is possible.

In any event, the community need not be very large before the individual will discount his influence on the consumption of others completely, accept the given prices and seek a maximum position within his means, thereby equating his rates of substitution to those of the market.

[2] See bibliography, item 207.

measurable, and the ideas have not caught on. The fashion remains to court disillusion at the static level in a formal manner, and pessimism informally at the dynamic level.

On the question of capital accumulation, extension of the optimum conditions to inter-temporal substitution had led to a proposed rule [1] that the quantity of money be adjusted so as to determine a rate of interest at which full-employment-saving and investment are equal. This rule is rejected by Graaff, among others, chiefly for two reasons.

First, the larger the existing holdings of bonds, the larger must be the supply of money in order to secure the full-employment rate of interest, a rate which therefore varies according to the volume of bonds in the economy. Indeed, if this is an objection, one might go further on the assumption of a wealth-saving relationship, popularly known as the "Pigou effect." For as Metzler has shown,[2] with such a relationship the rate of interest appears largely as a monetary phenomenon determinable by the Government's control of the quantity of money. In response to changes in the quantity of money, changes in the price level shift the full-employment saving schedule into equilibrium at the policy-chosen interest rate and investment level.

Second, the rate of saving depends not only on the current bond prices but also on expected future bond prices and, in addition, on variations in the general level of prices expected over time. But these prices, in turn, are influenced by the present and future saving of people, about which the individual saver and investor can have no clear information. Nor can the entrepreneur correctly estimate the productivity of his investment unless the investment plans of others, present and future, are known to him.

Now this second set of objections, though they may have particular relevance to capital accumulation, are surely general to all optimum rules. Unless direct information is available about everybody's present and future activities, or unless we can predict their effects on future prices, individuals are liable to make decisions they will regret and, in so far as they do make mistakes, incur "wastage" on the allocative criteria discussed. Sooner or later, there will appear "too much" investment in X, "too little" in Y and so on. Obviously these are the inescapable consequences of uncertainty. But having determined the other optimum conditions explicitly in the absence of uncertainty and, for that matter, in the absence of innovation, changes in taste, etc., we should be able to do no less for the conditions determining the rate of accumulation. Having done this satisfactorily, we may then consider the effects of uncertainty not only on the optimum conditions for capital accumulation but also, in general, on all the optimum conditions.

Keeping the analysis within a static framework, then, equality of the rate

[1] See bibliography, item 16.

[2] Lloyd Metzler, "Wealth, Saving and the Rate of Interest," *Journal of Political Economy*, 1951

of return over cost with the marginal rate of time preference appears to be a required condition for the optimum rate of investment—always ignoring indivisibilities and divergences between social and private benefit, which may, of course, be of special importance in dealing with investment goods. For if this equality does not obtain, say the rate of return exceeds marginal time preference, there is scope for making some people, as borrowers and lenders, better off without making others worse off—provided, always, we abide, as we do in static welfare analysis, by people's immediate judgment of their own good. And though, as in the first objection, variations in the volume of bonds and money will influence the rate of interest and, therefore, the rate of accumulation, thus giving rise to the problem of additional conditions (connected, perhaps, with the distribution of welfare), this rule will still be necessary inasmuch as its non-fulfilment leaves room for some net improvement in the community's welfare.

If, on the other hand, we do decide to place the whole subject in a dynamic context; to consider, that is, the distribution of welfare over time in conditions of uncertainty and, indeed, in conditions of changing productive organisation and social institutions, the inadequacy of the necessary conditions for an optimum position is apparent. It is with some such context in mind that Graaff abandons the conventional optimum conditions of capital accumulation and takes up the idea of a collective approach to this question. The things to be decided upon, all of which involve value judgments, are the choice of a time horizon beyond which we have no interest, the time distribution of welfare on our side of the horizon, and the amount, if any, of " terminal " capital equipment we bequeath to posterity beyond the horizon. These are not very firm materials to work with and, ere long, scepticism sets in and the whole lot is, in effect, emptied into the social-welfare function, there to meet a fate already prepared by Arrow.

The treatment of uncertainty *per se* is hardly more satisfactory. While there is a general case for spending on research and information services in order to improve expectations and guide business decisions up to the magic point at which the value of additional output attributable to such expenditure is just equal to such expenditure, the application of such an " optimum " rule is mainly guesswork. Again, some writers, such as Graaff, see proper to point out to us that, after all, uncertainty adds zest to life. One is already in danger of trailing off into banalities.

Treatment of the desirability of full employment, on the one hand, and stability, on the other; of government spending versus private spending; of standardisation versus variety; of speed of adjustment as against comfort and security,[1] are subject in greater measure to the same pitfall, since on such broad issues the relatively simple goal of pushing outward the welfare

[1] A rapidly adjusting economy imposes psychological strains on men and women which cannot easily be fitted into the welfare calculus. In this connection consult an informal and lively essay by Honor Croome in *Lloyds Bank Review*, 1959.

frontier or of comparing situations on the basis of compensation tests, give way to vaguer ideas of what is proper, and yet vaguer criteria, if any, for their implementation.

VI. A Summing Up

Many of the modern writers on welfare economics take a poor view of its prospects. Little warns us, more than once, against the impressions of rigour and refinement in an analysis which ought to be employed only as a rough guide to policy, though "good common sense" would do as well. Graaff is less compromising. On a close examination, he asserts, every proposition in welfare economics is found wanting. It is more profitable and more honest to bend our energies to the development of positive economics in order to serve the public by providing policy-makers with all the knowledge necessary to choose between alternative programmes. On the other hand, Reder ends his book on a rather indulgent note, one from a theme made familiar to us by Galbraith's *Affluent Society*. We are a wealthy country, he urges, speaking of the United States, we can afford waste. Is it really worth while scrimping at the margin in order to squeeze the most out of our resources? If the implication that welfare economics—which to Reder, but not to others, treats of scrimping at the margin—already enables us to squeeze the most out of our resources is granted, Reder's attitude might be justified, at least for the United States. But the strength of the recent attacks on welfare economics stem, rather obviously, from the belief in its being totally inadequate. If this be the case, there is no point to the judgment that the propositions of welfare economics are superfluous in view of the existing economic milieu. Therefore before passing judgment on the value for our economy of the study of welfare economics, let us briefly review some of the main objections to this study and consider how they might be met.

Though one can understand the general impatience with a subject which promises so much and, apparently, yields so little, Graaff's conclusions are too cavalier by far. Sweeping generalisation is to be regarded askance, no less when it is purely negative. True, few welfare propositions can be predicated which are not, almost in the same breath, qualified out of existence. But this fact is, to a large extent, a consequence flowing from our ignorance of the world we live in. In recognition of it, we busy ourselves ferreting out of welfare analysis all those tacit assumptions that appear to say something about the economic universe.[1] But this purging of tacit empiricism has gone too far. Any generalisation but the most trivial is sure to collapse when all bounds to technical and behaviour possibilities are removed—when allowance is made for any and every imaginable situation. Under so exacting a procedure, it is not at all surprising that unambiguous prescription is hard to come by. What the subject badly needs is a strong

[1] A parallel procedure in positive economics, as objectionable as it is common, is the "repudiation" of economic theorems simply because one can think up a less restrictive set of axioms.

infusion of empiricism to end its unchecked wanderings in the empyrean and to bring it down to earth feet first. Even the establishment of probabilities, or likelihoods, may enable us to escape the otherwise inevitable "perverse" cases thrown up, for example, by the inter-relationship of welfare distribution and relative valuation.

The import of these remarks may be illustrated by reference to some of the difficulties already encountered, assuming, provisionally, that private and social valuations coincide.

The general second-best theorem certainly takes the edge off the marginal-cost rule in all existing types of economies, but, maybe, not more than that. If we grouped commodities into broad categories, on the basis of close substitution, a small departure from an ideal output (in terms of these broad categories) could not, perhaps, be sustained long without a movement in prices so marked as to attract factors to some industries and repel them from others. If there were evidence for this belief then: (1) the existing degree of commercial rivalry might suffice to keep us close to the community's utility frontier, and (2) the precise rule for a nationalised industry may not be important with this scheme in mind. If, for instance, there are no substitutes for the product of a nationalised industry, then regardless of whether the price is set equal to average cost, to marginal cost or to something in between, the output demanded may be much the same. If, on the other hand, the nationalised industry produces a good, say electricity, for which other fuels are close substitutes, although the choice of the marginal-cost or average-cost rule may make an appreciable difference in the sale of electricity, the amounts demanded of all fuels taken together, measured in effective units, in some sense, may alter by very little. We should still be close to the utility frontier. Indeed, if we could rely upon existing enterprise, public and private, to keep us fairly close to an ideal output, we might abandon our concern with "utopian" welfare economics and pay more heed to the piecemeal approach. The compensation tests would then be serviceable in decisions to undertake entirely new projects. And though Little has spoken of consumers' surplus as a toy, it is hard to see how gains and losses on any scale can be computed without something of this sort. However, we are allowing that output in the rest of the economy is only roughly ideal. For this and other reasons given in Part IV, the area between the curves is only an approximation to the sum of the *CV*'s in the community. Only a slight gain in the practicable measure of the social surplus would not then be convincing evidence of the desirability of the investment in question.[1] Setting some minimal size of gain would have the added advantage of eliminating the

[1] Sir Roy Harrod, in correspondence with me, points out that to reject all projects unless a sizeable gain can be expected from their introduction would be a very damping maxim, and if adopted would deprive us of the fruits of progress. If, from our experience of things, a small change can be recognised as connected with a whole series of small changes whose sum results in a large change, then we should base our decisions, not on the data of each small change in isolation, but on the expected result of this large change.

possibility of contradictory answers which may arise when compensation tests are based on different distributions of welfare—though, on looking into the matter, we may have grounds for believing that, for all feasible distributions of welfare, the community indifference map, and hence, the corresponding outputs, vary but little.[1]

Turning to interdependent utilities, it must be admitted that if factor payments do not suffice both to compensate the factor-supplier for his additional sacrifice and to allay the heightened envy of others, existing output is too large. There is a temptation, in contemplating this circumstance, to lose patience with human cussedness [2] and to insist that if both the Smith family and the Jones family receive a 10% increase in their "real" income they *are* better off, even if they both sulk at the other's good luck. But while this may be salutary morals, if welfare is what people experience, there is no escape for us in honest indignation. We may be wise to invest more resources in social psychology in the hope of making people more "rational," but in the meantime we have to concede that an all-round increase of worldly goods may not make people any better off and, indeed, may make them feel worse off.

Nonetheless, we must remind ourselves that the kinds and degrees of welfare interdependence are yet in the realm of conjecture. Common observation, and intuition, suggest that it is a stronger factor at higher living standards than at lower ones. In the poorer countries, where the bulk of the populations still struggle for bare subsistence, it may be negligible.

In recognising that no promising foundations for a dynamic economics have been laid, we must not overlook the difficulties intrinsic to that level of analysis. Though relative prices, outputs and patterns of income distribution may be used, in certain circumstances, as indicators of changes in social welfare, for many of the dynamic factors that enter into welfare—time-paths of response, uncertainty, stability—no equally objective and measurable data exist, a deficiency which, in addition, makes agreement on norms more difficult. While this is a pity, it is not a fatal frustration. If we were more confident of our welfare economics at the static level of analysis it is not likely that we should be much inhibited by the recognition of unsolved dynamic problems. For whatever provision we make for uncertainty, patterns of response, capital accumulation, etc., practical criteria for improving the allocation of existing resources, and for choosing between alternative investment possibilities, could still be profitably applied.

[1] In the extreme case that the community indifference map remained unchanged for all distributions of welfare, allocative efficiency could be effectively separated from distributional considerations. In that event, "efficiency" tests, based on the compensation principle, could never contradict. Such a case, however, does not strengthen any prescription based on "efficiency" tests by themselves. (A sufficient condition for this extreme case to obtain exists when the consumption functions of all individuals are homogeneous and identical.)

Constant costs in the production of all goods do, of course, ensure unchanged relative prices, but do not ensure an unchanged combination of outputs, in response to redistributions of welfare.

[2] See bibliography, item 209.

Finally, though confidence may grow or decline as a result of empirical research, one thing should not be overlooked: the apparent trend towards economic egalitarianism apparently facilitates the application of welfare economics. For one thing, the stronger is this trend, the less we need worry about changes in the distribution of welfare causing contradictions in compensation tests. Indeed, in so far as equality is promoted by a highly progressive tax structure, the latter may be regarded as a sort of built-in compensatory device.[1] In the limiting case of completely equalising taxes, gainers automatically compensate losers, thereby fulfilling the uncontradictable Paretian criterion while continuously maintaining an ethically unobjectionable distribution of income.

Again, as Duesenberry has pointed out, in a world in which the gains of higher-income groups are resented by the lower-income groups,[2] an income tax goes some way towards correcting the conventional factor-product optimum condition by reducing the disposable marginal earnings of the factor below their value on the market. Indeed, not only does an income tax correct for social envy, this envy itself is reduced in so far as it is provoked by disposable rather than gross incomes. The more sensitive is the community in this respect, the steeper the progression of the tax necessary to correct the conventional conditions. In extreme cases only complete equality of disposable incomes solves the problem of interdependent welfares. In the nature of things, so extreme an institution is more likely to be encountered in an opulent society than in an indigent one.

Conclusions

It has already been suggested that explorations into the characteristics of the economic universe may show us a way round conceivable obstacles which have all too readily been adopted as logical impasses; that, provided we group commodities broadly, the allocative efficiency of Western economies—in the sense of being close to the utility frontier of society—may merit a high rating; and that a continuation of the trend towards income equalisation reduces the need for correcting the conventional optimum for interdependent welfares while, at the same time, facilitating the application of criteria involving compensation tests. Yet, if all this is accepted it does not follow that the prospects of a rehabilitation of welfare economics are good. For one thing, there are several important issues—such as the choice between variety and dearness, on the one hand, and standardisation and cheapness,

[1] Even though the resultant pattern of consumption varied widely as between one welfare distribution and another, in so far as a progressive income tax narrows the range of possible welfare distributions, it reduces the likelihood of contradiction using the various compensation tests. In the limiting case of complete equalisation no contradiction can arise—whenever "everyone" could be made better off, everyone in effect is made better off.

[2] There is no reason to believe, however, that a rise in the incomes of others of our group, or of the income groups beneath us, should be any less discomforting than an increase in the incomes of the groups above us. All increases of income, other than our own, amount to a loss of income status relative to some others.

on the other, or the proper division between private and public sectors of the economy—which the welfare economist can do little more than discuss in very general terms. For another, the notion of discrepancies between private and social benefit which, at first glance, appears a promising field for the application of welfare economics—and a salutary reminder of the limited capacity of the invisible hand—when pursued in earnest reveals grave difficulties. Certainly, the more serious objections to using index numbers, or consumers' surpluses, in the measurement of changes in social welfare do not reside in the tangle of interdependences which has chiefly engaged the interest of recent writers. (If we do not believe that, over time measured in decades, the great majority of families in the Western world have higher real incomes in the index sense, we can always suppose a tax structure that effectively maintains income equality, in which case a rise in the appropriate index indicates a rise in the real value of goods and services of each family.) So long as we restrict ourselves to measuring in terms of private valuations, such a rise in the index may tell us little of welfare, or happiness, as experienced by individuals. Advances in the techniques of production, and in the utilisation of material possessions, have repercussions on people's welfare far beyond the initial anticipations of satisfactions.[1] Of course, such repercussions may be regarded as manifestations of a divergence between social and private valuations, but they are not thereby rendered amenable to measurement.[2] Taken together, however, they can be of decisive importance.

While accepting, therefore, "an expansion of the area of choice" as synonymous with an increase of welfare for the individual, and as an unexceptionable norm of policy, it requires an alarming degree of complacency to believe that a rising standard of living as commonly understood is the certain instrument of an expanding horizon of opportunities. Obviously the growth of material prosperity, and its dispersion among the populace, entails—by definition, we might say—more goods, and new kinds of goods, among the mass of the people. But it is scarcely less obvious to-day that the

[1] The growth of private motoring provides a topical example. Each individual's enjoyment of his car varies inversely with the number of cars on the road. So long as cars increase faster than roads can be built the advantages—both for travel and ostentation—diminish. If we remind ourselves of the continual exasperation with which each motorist regards his fellow motorists, not to mention pedestrians, the inconvenience to the latter, the pollution of the air, the incessant noise, the problems of town planning, the growth of ribbon building and consequent spoiling of the countryside, the tying down of large numbers of police, the pressure on magistrates, to say nothing of the toll in killed and injured or the long-run effects on the national character, one may legitimately conclude that the yearly output of motor cars is too large by far, whatever the distribution of welfare.

[2] The cost of certain external effects, such as the smoke nuisance of factories, can be measured, roughly, by sample surveys. For an example, see Pigou, *The Economics of Welfare* (4th edition, p. 185, n.). But where the discomfort endured leaves no material evidence it may be as difficult for the person afflicted to estimate the appropriate money compensation as it is for others to accept his estimate. In those cases, which are by far the most important, where the introduction of new types of goods (and their conditions of production) change for better or worse a whole way of life for the community, there is no hope of estimating the cost of the "external effects."

concomitant subtopiaisation of society involves a continual erosion of opportunities, at least for a sensitive minority.[1]

To sum up, if welfare economics is to be repudiated as a serious branch of study it is not for the logical difficulties which inevitably appear when generality of treatment is taken to encompass all imaginable relationships. These difficulties, and others, we have suggested, may be far from insuperable. It is rather that a study of welfare which confines itself to the measurement of quantities of goods and their distribution is not only seriously limited, it is—at least in those countries where the mass of people have advanced far beyond subsistence standards—positively misleading. For the things on which happiness ultimately depends, friendship, faith, the perception of beauty and so on, are outside its range: only the most obstinate pursuit of formalism would endeavour to bring them into relation with the measuring rod of money, and then to no practical effect. Thus, the triumphant achievements of modern technology, ever-swifter travel, round-the-clock synthetic entertainment, the annual cornucopia of slick and glossy gadgets, which rest perforce on the cult of efficiency, the single-minded pursuit of advancement, the craving for material success, may be exacting a fearful toll in terms of human happiness. But the formal elegance of welfare economics will never reveal it.

E. J. MISHAN

London School of Economics.

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Abbreviations

A.E.A.	American Economic Association
O.E.P.	*Oxford Economic Papers*
E.J.	*Economic Journal*
J.P.E.	*Journal of Political Economy*
Q.J.E.	*Quarterly Journal of Economics*
S.E.J.	*Southern Economic Journal*
S.A.J.E.	*South African Journal of Economics*
C.J.E. & Pol. Science	*Canadian Journal of Economics and Political Science*
A.E.R.	*American Economic Review*
R.E.S.	*Review of Economic Studies*

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[1] For instance, foreign travel, once suggestive of the lure and enchantment of far-away places, has become a highly organised mass exercise with small opportunity of avoiding motorised traffic, crowds of camera-happy tourists and cynical tourist-hardened populations. For a particularly painful example of these things, read a report on "The Last Days of Andorra?" in *The Economist*, August 22, 1959.

Again, for those who enjoy a beach humming with portable radios, or the lakes teeming with motor boats, the world may be improving. But not for those whose tastes run to quieter things.

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Note to footnote 2 on p. 205.—FRANCIS YSIDRO EDGEWORTH, the first editor of the ECONOMIC JOURNAL, was not, of course, a Cambridge Economist. At seventeen he entered Trinity College, Dublin, and then went on to Magdalene Hall, and Balliol, Oxford. Later he became Tooke Professor of Political Economy at Kings College, London, after which he was Drummond Professor of Political Economy at Oxford. Sir Roy Harrod, in correspondence with me, has made it plain from his fairly intimate acquaintance with the man, that Edgeworth's approach and style of thought were very much in contrast with those of the Cambridge School. He was catholic in his views, extremely widely read, and had a high regard for certain continental writers, such as Auspitz, and Lieben and Pierson. Though he shared in some of the views of the Cambridge School he laid a special stress on the *inequality* of capacities for enjoyment and, therefore, on the desirability of an unequal distribution of income.

THE AGE OF ECONOMIC DEVELOPMENT[1]

TEN years ago an international banker speaking on the subject of economic development might have been able to take refuge in a fairly simple brief. Then, during the Marshall Plan, a group of nations with a common heritage and a common predicament banded together to pool their resources and resourcefulness for a limited and easily understood objective: they banded together to restore to themselves the economic strength and financial independence which had been lost in war.

To-day when an international banker talks about economic development he is expected to talk about the underdeveloped countries, which for my purposes can be taken to mean all those countries outside of Europe, North America, Japan and the older Dominions of the Commonwealth. Here there is no common heritage, and in so far as there is a common predicament it suggests no simple, short-term escape. Here the objectives are not easy to define or to understand, because the problems of development involve so many fundamentals. Here the objectives are not limited: we are talking about transforming whole societies and creating new traditions to replace traditions which have been rendered tragically inadequate by the passing of time.

I envy the man in public life to-day whose field of responsibility is outer space; it is such a neat and tidy field compared with economic development!

Perhaps it is because I am uninhibited by an extensive training in any academic discipline that I agreed to appear in this distinguished forum to speak on this tangled subject. Certainly I must disclaim right at the start any intention of making my mark as a theoretician—or even as a lecturer! I am a practitioner without a professional licence, a journeyman in a trade that has yet to be recognised officially as a trade.

I will preface my remarks with a journeyman's view of the nature of economic development, and then describe how the World Bank approaches development problems in practice. In stating the Bank's case I will point out where our path crosses the paths of others—in the underdeveloped countries and in the industrialised countries—who view economic aid in a different way. My aim is to isolate the ground of hope on which the idea of economic aid rests. Some, I am afraid, may find I have marked off a disappointingly limited ground, but I do not regard my conclusions as pessimistic. On the contrary, I believe economic aid is the best way—probably the only really important way—in which the rich and the poor nations to-day can bridge the gulf, not only in wealth but also in communication, that separates them and poses such a threat to world comity.

[1] The Cyril Foster Lecture delivered by Eugene R. Black, President of the International Bank for Reconstruction and Development, at Oxford University, March 3, 1960.

It is very easy to forget how exceptional, historically, are the attitudes and institutions necessary for modern economic growth. There must be a willingness to work hard in a productive job and to postpone some consumption to-day for investment to-morrow. There must be money savings and institutions capable of investing savings productively. There must be a liberal supply of technical education, liberally spread among the population. There must be a code of laws which places contracts among producers above arbitrary political action. People must be willing to move about to new homes and new jobs. The economy must employ the measure of profit to determine productive efficiency. Society must be willing to accord a measure of respect and reward to the innovator who is willing to devote his time and talents to producing new things.

Just to list a few of the requirements is to illustrate how ambitious is the task of those who would bring modern economic development to an underdeveloped country to-day. And how uncertain is the outcome in a society which sets out to absorb these very special institutions and attitudes! Savings may be put aside voluntarily, or they may be exacted by force. A code of laws may serve the aim of productive efficiency without serving the ideal of justice. Productive efficiency by itself tells nothing about the end which production is designed to serve. Profit may be regarded as the measure of a producer's success in meeting consumer demand, or as the measure of a commissar's success in meeting his assigned production target. Innovators may be rewarded with money or with power—for enriching the lives of individuals or for strengthening the power of the state.

Economic progress, in short, is not the same thing as moral progress. Man does not come naturally by any of the attitudes and institutions necessary for economic growth; he must be driven—even to hard work—by need, or by the prospect of material gain, or somehow these attitudes must be made politically or religiously inspiring. Advocates of these attitudes and institutions, therefore, face great uncertainties from which no innocent optimism can protect them.

Realisation of this fact came hard, even to many of the Great Puritans who did so much to make thrift and hard work respectable in western society. Listen to John Wesley, speaking at the height of the Methodist revival at the end of the eighteenth century: "Our religion," Wesley said, "must necessarily produce both industry and frugality, and these cannot but produce riches. But as riches increase, so will pride, anger and love of the world in all its branches. So although the form of religion remains, the spirit is swiftly vanishing away. Is there no way to prevent this?"

To Wesley and to the other Great Puritans thrift and hard work in a productive job—only, of course, they spoke of it as a calling—was the very ritual of a life of service to God. We can no longer speak innocently of these attitudes as Puritan virtues now that we have seen them regarded in more than one instance as the very ritual of a life of service to an all-powerful totalitarian state.

If one were given the choice of starting anew a process called " economic development " in the underdeveloped world to-day one might well and prudently decline on the grounds that the whole idea was too hazardous to merit serious consideration. But of course the process has already started. Outsiders have been disturbing the peace of tradition in these parts of the world for a very long time now. First came the traders and missionaries, the doctors, investors and colonisers; then came modern transportation and communications, modern armies and modern factories. As a result of economic and political penetration and the multiple inventions of science and technology, there is hardly a human society left on earth which has not been thrown off its traditional balance by the expansion of modern economic life.

There is reason to call this the Age of Economic Development. But in these lands that we call " underdeveloped " the impact of economic growth so far has done as much to destroy old habits and attitudes towards life and work as it has to create the new attitudes necessary for a better material life. Economic development in these lands has proved peculiarly fickle; even now it is creating human desires much faster than it is providing means for their gratification.

And, as everywhere that it has gone before, it has left in its wake an immense increase in the sense of human power—man's power over nature and over his fellow man. Millions in these parts of the world have been made aware that their poverty is not inevitable, not divinely ordained. And from these millions leaders have emerged, dedicated to the task of telescoping into a few short decades all the material and social change that evolved elsewhere only over a century or more. Armed with an awareness of the great store of technical knowledge available to man, they are eager to catch up, to narrow the great disparity in wealth which separates their countries from the industrialised countries. They want wealth and power, not only for its own sake, but as part of a renaissance in their own cultures.

At the same time economic development has left in its wake in the underdeveloped world tragic problems which only more economic development can solve. There is no other escape from the problems of population pressure on diminishing food supplies and living space. There is no other escape from the feelings of national and racial inferiority which have come to be associated with mass poverty. There is no other escape for those who have experienced modern education and modern living standards and who now want opportunities to practise their knowledge and to bring a better material life to their countrymen.

So we can say that without economic development there is no hope for a future in these parts of the world in which the people there can live in some decency and order. And we can say that no matter how ambitious the task or how uncertain the outcome, the free world community must participate. They must participate simply to maintain the balance of hope in a future

which is compatible with a respect for individual freedom and for tolerance of racial and national diversity. For those of us born and brought up in the comforts and prosperity of the western world, there has never before been such a fundamental challenge to our beliefs.

If we cannot tame this fickle process called economic development, how do we deal with it in the underdeveloped world? The World Bank has one answer to this question. Let me explain it.

In the World Bank we concentrate on economic development as if its only end were higher consumption and greater comfort. We try to remove the taint of ideology from the language of economics and then relate that language solely to the end of promoting higher material living standards.

We look on ourselves as technicians or artisans, but this is by no means an innocent pretension. We look on ourselves as artisans in order to avoid seeming to make a choice for our member governments from among the various aspirations of their people. Our own vocation, as embodied in our charter, is to deal in economic facts as they relate to higher material living standards for a whole community. We recognise that our member governments must deal in all kinds of facts and often must bend economic facts to ends other than consumption and comfort—to the demands of national security, and cultural development, for example.

Words like "savings" and "investment," "efficiency" and "productivity" are the tools of our trade, and, like good artisans, we try to develop proper standards for their use. But again this is not an innocent pretension. We think that in administering economic aid quality is more important than quantity; even the most enthusiastic supporters of economic aid recognise that the outside world cannot provide more than a small margin of the resources needed; the really crucial economic and human resources must come from within. Therefore, it is only realistic, we think, to try to use economic aid primarily to promote proper standards in the art of managing a country's resources. The Bank adapts its standards to special circumstances and in the light of new knowledge; but we stick to certain fundamentals, even if that means that sometimes we don't do business. We wouldn't get away with this unless we sought constantly to render the language of economics as morally antiseptic as the language the B.B.C. announcer uses in reading the evening news.

Finally, the success of any economic aid agency—whether it be a national, international or regional agency—depends as much as anything on the ability of that agency to make and keep contact among its members despite the changing temperatures in the international political climate. This means the agency must have a sign on its door, "Open for Business Year 'Round." Of course, it is easier to meet this requirement in an international organisation; the Bank has many disagreements with its borrowers, but they are not the kind which lead to withdrawing ambassadors or

mobilising armies. But this protection would be of little use, I think, if we couldn't also establish in our member countries continuing contacts with people who regard the promotion of economic development the same way we do—as an end in itself, if you will. In fact, there exists a very sizeable guild of artisans in economic development in the underdeveloped world today; within the guild a very healthy exchange of information on the state of our trade goes on all the time. That there are those continuing contacts with people who speak the language of economics in the same way we do is to me more encouraging than all the statistics in our annual report.

The capital at our disposal is our earnest money, the tangible evidence that we take our vocation seriously. With it the Bank has been able to operate in fifty different countries over the past fourteen years, participating in some 800 development projects and programs, involving a total investment in excess of £3,500 million. This has not been a period noted for international harmony and order. Yet there has been enough order in the underdeveloped world to allow us to think of broadening our work. Our member governments are now considering the charter of a new International Development Association, to be affiliated with the Bank, which will make capital available for investment on more flexible terms than World Bank loans. This new organisation, while disposing of a very modest amount of capital at the start, will enable us to expand our operations in some of the poorest countries, which are now reaching the limits of their ability to repay loans extended in foreign exchange on conventional terms.

Now this is a rather sober and certainly not a very dramatic conception of economic aid. It may seem a considerable feat of mental gymnastics to connect what I have been saying with the noble ends of world peace and freedom. But there is a connection, and I think the best way to illustrate it is to contrast this conception of economic aid with some others which prevail both in the underdeveloped world and outside it.

As I have said, my aim is to isolate the ground of hope on which the idea of economic aid rests. It is certainly not to assert any final authority for a given set of economic criteria; in fact, part of the reason for making comparisons is to illustrate the perils in asserting final authority for any one set of criteria at all when addressing the problems of the underdeveloped world.

Some economists, for example, find it a fascinating exercise to apply economics to India's famous sacred cows. One economist recently pointed out that these cows eat up in one year as much food as the United States supplies to India each year from its surplus stocks. But obviously in this and similar circumstances in the underdeveloped world the economic facts, however fascinating, just don't count for much. As one acute observer remarked, "Theology cannot be answered by economics; only by better theology."

Actually, we have found that it is not so much the older theologies which

threaten the effectiveness of economic aid; rather it is the newer ones. We find our most serious conflicts are with those in the underdeveloped countries —and in the industrialised countries, too—who pursue economic development and seek economic aid for reasons which have little or nothing to do with promoting higher material living standards. And these are conflicts where economic facts do—or should—count for a lot. Let me examine a few—in the underdeveloped countries first.

The governments of the underdeveloped countries to-day, besides having to reconcile traditional attitudes towards life and work, also have to reconcile most of the competing objectives found in richer societies. Maurice Zinkin, in his brilliant book *Development for Free Asia*, puts the matter very succinctly:

> " Economic progress is sought today in Asia as elsewhere for reasons which are not economic," he writes. " High cost industries are built up because they are thought to contribute to national power. Labor amenities, better than productivity justifies, are enforced so that (factory) laborers shall have a better life. High incomes are taxed almost out of existence to increase equality. Location of industry is interfered with so that every part of the country shall have its ' fair ' share of development. The large farmers, who know about agriculture, have their holdings cut down so that more of the landless can enjoy the pleasures of ownership. And so on."
>
> " The criteria applied [Zinkin concludes] mostly have nothing to do with economics; and the result is, naturally, that though there may be more equality or greater regional fairness or possibly fewer revolutions, there is also less development."

If I didn't know better, I would think Mr. Zinkin had been reading economic reports at the World Bank—and not just those on Asian countries.

It is these conflicts which make economic aid to the poor countries to-day a delicate and at times an agonising business. The claims of poverty appear so compelling that the outsider is tempted to conclude that all argument over the niceties of equality, or of regional " fairness " or of national prestige is really too much of a luxury to be tolerated. But such an attitude does less than justice to the governments of these countries; the political problems they face are excruciatingly difficult; they are the primary agents of change in societies undergoing a wholesale transformation to prepare for modern economic life. In western societies the primary agents of change in the early stages of development were the entrepreneurs; governments could then confine themselves to ruling—to maintaining law and order. Now governments in the underdeveloped world are taking most of the development initiatives themselves, either because there is no entrepreneurial class of any significance or because only the Government can raise the necessary capital. They have to lead as well as rule. To help these governments perform their necessary development functions without generating extravagant forms of political injustice and cruelty is really the major objective of economic aid.

Clearly economic aid cannot escape involvement in the moral and

political hazards which the choices before these governments entail. But in so far as economic aid serves directly and exclusively to promote an orderly consideration of development problems as a means to higher material living standards, it can, I think, be a most helpful and hopeful persuader. The very process of development planning requires these governments to bring together in one place all the competing claims on the country's resources, and to decide upon a reconciliation of these claims in accordance with some set of values. And then planning brings an awareness of costs and benefits; it helps make clear that often the cost of an expensive monument to the glory of the State is to make the population poorer and weaker in the long run because of the waste of resources involved.

Orderly development procedures can help to bring about a realistic division of functions within government and between government and the private sector. They can help persuade a politician that the management of a power system is best left to a technician so that the politician can have more time to devote to the really important development decisions. They can lessen hostility to the foreigner's investment by creating more awareness of how much slower economic growth is without it. They can lessen enthusiasm to penalise the successful farmer and business-man in the name of equality by creating an awareness of how much less food, jobs and basic comforts of life there will be with such penalties.

In practice, the Bank has found that these conflicts are not always as agonising as they appear in theory. We have reason to believe that in many cases argument over the conflicts between growth and equality, growth and national security, growth and cultural development is more a symptom of frustration than its cause. Often the argument is most heated where there have been some tragically wasteful experiences with development, and where as a result order has given way to rationalisation and self-justification.

There is no more certain cause of frustration than the power plant, standing like the statue of Ozymandias in the desert, with no transmission lines connecting it with reality because the money ran out. Or the industrial plant without a market or even the prospect of a market, because nobody looked for a market before building it. Or the brand new turbine rusting on the dockside because somebody decided to buy it before deciding what to do with it. Or the newly irrigated lands lying fallow for lack of anybody to cultivate them. Such situations exist, and they suggest to me that economic facts can be very welcome and hopeful persuaders if they are presented in the right way and with a generous hand and heart.

If these tractable problems can be tackled, there is real hope that the job of reconciling competing objectives will become more manageable with time. There is real hope that people will take ideology less seriously simply because they will be too busy. But how important it is to focus economic aid on the tractable problems, the problems of engineering a series of escapes from the worst pangs of poverty. How important it is to nourish through the

thick and thin of political change every point of contact among the artisans of economic development. How important it is to develop a pride of workmanship so that every ounce of resources available for promoting higher material living standards is used as efficiently as possible. And how important it is that the free world community stand ready to pledge whatever measure of its wealth can be usefully absorbed in this endeavour.

I have spoken of some of the points where the Bank's path crosses with the paths of some in the underdeveloped countries who are pursuing economic development for reasons which have little or nothing to do with the aim of promoting higher material living standards. Now let me turn to the industrialised countries.

There is a tendency on the part of some in the industrialised countries to regard economic aid solely in the context of diplomatic and military policy—either as a weapon in the Cold War or to be used in defence of some narrower political or diplomatic interest. This is hardly surprising. Diplomatists and military strategists are trained to think in terms of power; they tend to look on economic aid as nothing different from other exercises of national power—to regard economic aid as just another means of serving narrow national interests.

Certainly I have yet to meet a political leader in the underdeveloped world who seriously thinks economic aid is offered by any sovereign nation for motives completely divorced from its own interests. But I ask these diplomatists and military strategists what interests they think they are serving when they offer economic aid in exchange for a military alliance or a diplomatic concession? They are certainly not serving the interest of orderly economic development; in fact, they may well be abetting and perpetuating conditions which in a short time will render their military alliances and diplomatic concessions quite hollow victories.

In these circumstances the Government of an underdeveloped country is likely to feel it has fulfilled its part of the bargain when the treaty is signed or the vote in the United Nations taken. That Government is not likely to take very seriously any protestations of concern about economic development—or pay much attention to what is said on the subject. In these circumstances economic facts can hardly be very hopeful or helpful persuaders.

I sometimes wonder—if you will pardon a digression—what would happen if, where governments believe their interests are served by supporting foreign military establishments, some of the aid money were used to encourage soldiers to try their hand at economic development. In many underdeveloped countries a great deal of prestige is attached to life in the Army; as a consequence, much of the administrative and technical talent to be found in that country is found in the Army. Now armies can perform very useful development functions; the American army certainly did in the last century; in fact, the United States Military Academy at West Point was

founded in 1812 as a school of engineering. The American Army's Corps of Engineers opened up a good deal of the United States, building canals, roads and dams throughout the Middle and Far West. In some underdeveloped countries to-day there would be a radical change in the economic environment if the Army were to perform such tasks. I don't mean by throwing out this suggestion to meddle in the affairs of the military strategists, but who knows: maybe if there were more corps of engineers, there would be better military alliances in the long run.

Of more fundamental concern is the widespread belief in the free world community that economic aid is a weapon in an ideological competition with Communism. This idea of an ideological competition clearly serves the interests of the Communists; but I question that it serves anybody else's interests.

The Communists, of course, paint a picture of the world which has nations divided according to a label stuck on their economic system—the one labelled "Capitalist," the next "Socialist" and the third, "Communist." The pattern reflects their determinist view of history and their belief that theirs is the one sure road to the Good Life. But what other ideology does this pattern fit?

In countries where individual freedom is fostered, conflicts over the use of economic power are resolved through the give and take of the democratic process. There is a continually changing emphasis with the ebb and flow of politics between the aim of an egalitarian distribution of material wealth and the kind of less-equal distribution which is necessary to provide rewards in money for the successful innovator or investor. There is, similarly, a changing emphasis between the demands of growth and national security, between the demands of growth and regional prosperity, and even between the demands of growth and ownership and control of property. It is largely by not claiming any final authority for any determinist view of economics or of history—that is by not taking ideology too seriously—that the western world to-day enjoys democracy and freedom as well as the highest material living standards.

How ridiculous, then, to accept the terms of competition laid down by ideologues who, in the first place, believe quite wrongly that all economic power is vested in the ownership of property; and who, in the second place, have fashioned the implausible theory that, simply by abolishing the institution of private property, economic development can be made into an escalator to carry society to a state where all social friction arising from the exercise of economic power has disappeared?

And how dangerous it is to encourage those in the underdeveloped world to believe that the Communists' terms of competition are anything but an illusion. The leaders of these countries have often stated their determination not to repeat the mistakes which the industrialised nations made during their

development. Economic aid should serve to bolster this determination—and to point out the greatest mistake that can be made is to succumb to the illusion that the competing aims and aspirations of their people, as they concern economic development, can ever be settled once and for all.

Capitalists, of whom I consider myself one—and may not I say Socialists, too?—have come in a great many shapes and sizes for a great many years now. Should we not be proud of this diversity and lay stress upon it? And while we are at it, cannot we say that Communists, too, are beginning to appear in a few different shapes and sizes? Shouldn't we also stress this? After all, the quest for peace demands that the Communists be encouraged to shed their illusions about the nature of competition among nations even as we shed ours.

There is another point of conflict between the view of economic aid as a vocation and another view found in the industrialised countries. There are some who believe that development aid to be worthwhile must have a direct and immediate economic benefit to the donor country. Usually the benefit sought takes the form of an export order or of a new source of raw materials.

The whole question of the relation between trade with the underdeveloped world and economic aid is currently being reviewed in many quarters and involves several very complex technical problems. I only want to underline one broad generalisation.

The relation between trade and investment with the underdeveloped countries is a fundamentally different one to-day from what it was even a generation ago. Before economic development was a primary aim of the governments there, international investment in the underdeveloped world could be regarded simply as an arm of trade—either as a source of export orders or of raw materials. Now that governments in these parts of the world are forcing the pace of development, the rate of increase in trade over the long run will depend increasingly on the development of new markets in the underdeveloped world. And when I use the word "markets" I am talking about customers with whom it will be possible to do business over a number of years, not just on a hit-and-run basis.

This means that trading governments and traders alike need to-day an investor's outlook towards trade with the underdeveloped world. This trade cannot be financed on the old, mercantilist pattern without endangering the whole order of international financial transactions and contributing to the delinquency of the economic-aid idea. Successful trading ventures with the underdeveloped world to-day demand that the industrialised countries give much more time than in the past to trying to calculate the real economic benefits on both sides of the equation, not just the immediate benefits that may accrue to the exporter. In so far as economic aid is used merely to bail out exporters who have unloaded their wares, not wisely, but too well, both the ends of aid and of trade in the long run are frustrated.

And again who is going to listen to what is said about economic

development, or to think there is any serious concern with it, if the idea gets around that what is really wanted is a subsidy for an export industry?

As I said, I have been giving a journeyman's view of economic development, the view of one who practises economic aid as a vocation.

I have said that scientific and technical knowledge is power; that all exercise of power in international affairs—and economic aid is one such exercise—involves inevitably great moral and political hazards. But not to exercise this power clearly involves even greater hazards; it amounts to saying that this knowledge has no enduring worth . . . or to saying that the free nations of the world have lost the courage to use the great power of their knowledge to help others to live in freedom.

To-day the free nations can exercise their power constructively in the world only as part of a contract between or among sovereign equals. That is why it is as a vocation that I pledge the idea of economic aid to you to-day. Until governments—in the capital-exporting countries and in the capital-importing countries—decide that the primary objective of economic aid is the raising of material living standards—until they accept this objective as something different and apart from other objectives they are pursuing—economic aid can only generate false hopes and disillusionment, both in the underdeveloped world and in the industrialised countries.

It is no mean vocation for the free nations to make sacrifices to help find an escape from poverty for those millions whose ways of life have been rendered so tragically inadequate by the recent course of history. Such sacrifices ennoble the ideals of freedom and tolerance far more than any eloquence man can muster.

And in what more practical way can the free nations demonstrate their concern for maintaining peace in the world? By applying our knowledge to specific conflicts, to specific predicaments; by borrowing from the Puritans their love of work and pride of workmanship without their innocent pretensions; by standing ready to do business with one and all who are willing to regard the pursuit of economic development primarily as a means to higher material living standards—by doing all these things, we can have real hope that time is, indeed, on the side of peace and that these societies will evolve in ways which are compatible with a respect for individual freedom and for tolerance among nations and races.

Human progress, someone once said, is best regarded as a series of escapes from one predicament to another, with the ground of hope being the measure of advance. It is very literally, very tangibly to preserve this ground that the world community should aid the economic development of the underdeveloped world as a vocation, as an end in itself.

EUGENE R. BLACK

International Bank for Reconstruction and Development, Washington, D.C.

SECOND ESSAY IN DYNAMIC THEORY[1]

1. I AM offering this article as a companion piece to one that appeared rather a long time ago and contained a form of equation, which has since become fairly well known.[2] I am now presenting a second form of equation, and submit that the two together provide the inner core of the dynamic theory of an insulated economy.[3] Demand and supply are essentially static concepts and not strictly applicable in dynamic analysis. But in a certain sense the equation in the previous article may be regarded as a dynamic analogue of the static law of demand; if that is allowed, the equation in this article may be regarded as an analogue of the static law of supply.

2. I do not hold that the two equations constitute what is called a "model," any more than the laws of demand and supply taken together constitute a model. Rather they should be thought of as laws expressing certain necessary relations. They are not, of course, necessary in the sense of being *a priori*, for in that case they would be empty and uninformative. They are empirical, but necessary in the sense that they flow necessarily from postulating certain very general facts in the human situation, themselves known empirically, such as the existence of a multiplicity of needs and the availability of an insufficient amount of productive resources, which can be applied to alternative uses,[4] notably to present or future satisfactions. They are prolegomena to model building. In attempting to construct a model we seek to enter more deeply into the empirical phenomena. I believe that a model can properly be distinguished from a set of fundamental laws by the presence in the former of certain adjustable parameters.

3. There has been some terminological hesitation between the use of "dynamics" and "growth theory" in relation to certain matters. I believe that a distinction can be made, and that it would be convenient to use "dynamic theory" for the relations between the rates of increase (or decrease) of certain magnitudes in a growing economy. The theory of economic growth would have a wider ambit, including dynamic theory in this narrow sense. It would comprise also such matters as the sociological effects of the impact of economic progress, the contribution of the social pattern to it, the contribution of education, both general and technological, the need for political security, the usefulness of greater or less governmental intervention in successive phases, the development of moral codes, etc. For instance, there are wise men who hold that the prevalence of graft is the

[1] I am grateful to Mr. M. F. G. Scott for certain helpful suggestions.

[2] "An Essay in Dynamic Theory," ECONOMIC JOURNAL, March 1939.

[3] The dynamics of foreign trade and investment, on which Prof. H. Johnson and others have been doing notable work, must be an important part of the total theory.

[4] Cf. Lionel Robbins, *Nature and Significance of Economic Science*, Chapter 1, p. 15.

greatest single obstacle to growth in some developing countries. In fine, growth economics would then constitute the " political economy " of growth, while dynamic theory would be its pure economics.

4. My original equation has been criticised for excessive rigidity, notably for not allowing for the possibility of substitution in the productive process as between capital and other factors. In my *Essay* I used the term C for the optimum amount of capital required per unit of time, given current technology, for the output of an extra unit, and C_p for the actual accretion of extra capital per unit of extra output. In my book, *Towards a Dynamic Economics*, I used C_r for the optimum amount of capital required, reserving C for the amount that actually occurred. This latter symbolism seems better, and I shall adhere to it in what follows. It is argued that the value of C_r must depend on the rate of interest, and that consequently what I have called the " natural " and " warranted " rates of growth are so dependent. Recognition of this, it is claimed, could have far-reaching effects on the analysis.

5. In self-defence I may observe that I did recognise this dependence in the *Essay*. " The value of C_r may be somewhat dependent on the rate of interest " (p. 17). If I did not develop the implication of this any further, that was mainly owing to the maxim of attempting to do only one thing at a time. I must confess, however, that I was also somewhat influenced by the view, which was prevalent in those days, that producers were but little influenced by the rate of interest in their choice of more or less capital-intensive methods of production. When entrepreneurs reported that, owing to the risks of the market or of obsolescence, a piece of equipment was normally expected to pay itself off in four or five years, how could variations in the interest rate within the range commonly experienced have any appreciable effect? This was doubtless too sceptical. Even at that time it was recognised that the rate of interest had influence on long-lasting capital installations. Since then I have been much impressed with the significance of the imperfection of the capital market. The rate of interest should be regarded as the barometric reading in that limited part of the market which is perfect (organised stock exchange, discount market, etc.). When capital disposal is short, the perfect markets record high readings; but for many the shortage impinges on them simply by would-be borrowers finding it difficult to raise money. Accordingly, a wrong impression may be gained by putting the question to producers in the form—are you influenced by the rate of interest? This implies a nice calculation, balancing a rate of interest of so and so much against an expected yield of the projected assets on their cost of production. Many of the producers who deny ever making such a calculation may none the less be influenced for or against a more capital-intensive re-deployment of their productive set-up by whether the required finance is easy or difficult to obtain. In any case, a theory which makes no allowance for the possible variation in C_r in response to the abundance or

shortage of capital disposal is defective in principle. It is now sought to remedy this defect.

6. In my equation for warranted growth, which it is convenient to repeat,

$$G_w = \frac{s}{C_r}$$

s, the fraction of income saved, is taken as an independent variable. Its value is assumed to depend on the private convenience of many individuals, on the desires of many firms to finance themselves from their own ploughed-back profits, etc. This assumption of the independence of s is appropriate in its context. Indeed, the fact that the "warranted" rate of growth may not be equal to the "natural" rate depends precisely on the assumption that private motives may not yield the amount of saving that complies nicely with the needs of the society; they may generate too much or too little saving. The Keynesian origin of this idea is obvious. Natural growth (G_n) by contrast is conceived as a welfare optimum, in which resources are fully employed and the best available technology used. With natural growth so conceived, the amount to be saved becomes a "requirement," which may be greater or less than the actual s. But is not this "natural" rate itself indeterminate, unless the rate of interest is specified? There is clearly a lacuna in the theory.

7. I have to ask the reader in what follows to subject himself to a certain discipline, which may not be altogether easy. I regard the fundamental concept in dynamic economics as the rate of increase, just as the state of rest is that of statics. It is the rate of increase that obtains *at a given point of time*, given the fundamental determinants. In dynamics, or at least in Part I of dynamics—and I do not think that we can yet get beyond that—we are not, according to my view, concerned with a succession of events through time. The analogy with mechanics is, surely, precise. There we seek to determine the velocity of a particle in consequence of the forces acting upon it at a particular instant. Thereafter it may become subject to new forces. The dynamic determinants of economic progress change from time to time, and the consequence of such changes will have to be considered in due course. But, to begin with, we need to determine the rate of increase at one point. This is but applying in the realm of dynamics the procedure so well known, and, I would say, fruitful, in the theory of static equilibrium. It has always been recognised that the determinants of that equilibrium (desires of individuals, etc.) are constantly changing; none the less, it has been found serviceable to establish the equilibrium pattern required by a given set of determinants. I am convinced that we must do this in dynamics also, as an essential prelude to all else. Edgeworth once said of general value theory that "the path is short, but very slippery." If this is true of dynamics also, as is surely the case, we must proceed carefully, step by step. One consequence of this method of initial approach to dynamics is that time-lags do not appear in the equations.

8. This article is unlike the earlier *Essay* in that it will lead into the subject by reference to the welfare optimum. I believe that on a broad historic view we find that attention to the welfare optimum played a vital part in the formulation of static equilibrium theory. This may be a good precedent.

9. The second lecture in the course published as *Towards a Dynamic Economics* is called the *Supply of Saving*. This contrasts with the title of the third lecture, *Fundamental Dynamic Theorems*, and suggests, correctly, that what I had to say about saving could not be regarded as an integral part of dynamic theory. The *Supply of Saving* contains an equation (p. 42) which has been found, justifiably, somewhat obscure. The matter was rendered worse by inaccurate notation in the earlier editions. I will set it out in its most convenient form; the reader need not trouble himself, at this stage, about its justification, which will appear later. C_0 is consumption in year 0, C_r is consumption in year r, e is the elasticity of the schedule of the diminishing utility of income in its relevant range, T is " time preference " expressed in the form that, if a given unit of utility in year r is considered only half as preferable as the same unit of utility in year 0, $T^r = 0{\cdot}5$, and R^r is the amount of money to which 1 unit will have accumulated in r years at the current rate of interest.

$$C_r = C_0 + e\left(1 - \frac{1}{T^r R^r}\right)$$

In formulating this I was much influenced by F. P. Ramsey's famous article entitled " A Mathematical Theory of Saving." [1]

10. Ramsey's article contains a concept which he calls " Bliss," namely, " the maximum obtainable rate of enjoyment or utility." This concept is unsatisfactory for two reasons. It is unsatisfactory for dynamics, because Bliss is essentially a static concept. It is also unsatisfactory for any kind of welfare economics, because Ramsey's technique requires a comparison of the total utility achieved at " Bliss " with total and marginal utilities currently achieved, and this is manifestly altogether impracticable.

11. In my lecture on the *Supply of Saving* I gave a second equation, based on the assumption that it could be foreseen that the globe would be vaporised by a nuclear explosion n years hence. This second equation, along with n equations of the form given above, would suffice to determine the values of all the terms. Thus the Explosion would take the place of Bliss in governing the correct rate of saving. I next proceeded to some more realistic observations about a man's probable attitude to his own life and to his heirs. It was obvious that no precise theory could be based on such vague psychological speculations. Thus the matter lapsed, and my discourse on the supply of savings did not yield anything that could be included among the " fundamental dynamic theorems."

[1] Economic Journal, December 1928.

12. Although I had warned myself and others in the *Essay* that the formulation of a dynamic theory "involves something wider: a method of thinking, a way of approach to certain problems," [1] I was still so deeply rooted in static ways of thought, when I composed the Lectures, that I did not perceive that I had under my nose what was really a dynamic equation. As Keynes observed, in relation to a different problem, namely that of his *General Theory*, it is exceedingly difficult to wrench oneself from the habits of thought in which one has been educated.

13. I now set out my "second" equation, derived from my abortive attempt, based on Ramsey, in the lecture on the Supply of Saving. Its demonstration is given in the following paragraphs. I would venture to suggest that its *simplicity* entitles it to be regarded as a fundamental equation. Let r_n be the rate of interest appropriate to a natural (welfare optimum) rate of growth, and ${}_{pc}G_n$ the natural rate of growth *per caput*.

$$r_n = \frac{{}_{pc}G_n}{e}$$

This dispenses us both from having to have regard to "Bliss" or from having to make arbitrary assumptions about what a man may feel that he ought to do for his heirs.

14. The equation supplied in para. 9 above is based on the proposition set out in *Towards a Dynamic Economics* (p. 45) that the individual's distribution of his consumption between year 0 and year 1, in equilibrium, is given by

$$u(C_0) = RT \times u(C_1)$$

where $u(C)$ is the marginal utility of consumption. This signifies that, given the rate of interest and the time preference, consumption is so arranged that no re-distribution of it from year 0 to year 1, or conversely, would increase utility (as modified by time preference). Define, for the sake of simplicity, e as

$$e = \frac{C_1 - C_0}{C_1} \div -\frac{u(C_1) - u(C_0)}{u(C_1)} [2]$$

Represent $\frac{C_1 - C_0}{C_1}$ by $G(\text{con})$

Reducing the above, it follows that, in equilibrium

$$RT - 1 = \frac{G(\text{con})}{e}$$

15. The equilibrium of static economics implies that saving is zero. A steady rate of increase implies that a constant fraction of income is saved. If the fraction of income saved is increasing or decreasing, that implies an

[1] *Op. cit.*, p. 15.

[2] The difference between this definition and $e = \frac{C_1 - C_0}{C_0} \div -\frac{u(C_1) - u(C_0)}{u(C_0)}$ disappears when the matter is expressed in terms of differential equations.

accelerating or decelerating increase of income. Accordingly, in the equation representing the rate of increase at a point of time it should be assumed that a constant fraction of income is saved. Thus for the equation last given we may substitute:

$$\text{In equilibrium,} \qquad RT - 1 = \frac{G}{e} \qquad . \; . \; . \; . \; . \; . \; . \; . \; (1)$$

This equation defines the equilibrium behaviour for an individual, if we abstract from his employment pattern (retirement in old age, etc.), and assume a constant rate of growth of his income. If we translate this into an equation representing the situation of the community as a whole, e must be a weighted average of the e's proper to each individual in it, subject to the abstractions of the last sentence. This assumes a constant income distribution. This assumption is simply carried over from the welfare optimum of static economics, where the income distribution is taken as given. Ultimately, we should be able to accommodate a steadily changing distribution of income in dynamic theory; this would (or might) entail a steadily changing rate of growth. (It is quite possible, however, the e does not differ much as between rich and poor.) With e thus re-defined, we can transform equation (1) into a community equation, in which ${}_{pc}G$ represents the growth of income *per caput*.

$$\text{In equilibrium,} \qquad RT - 1 = \frac{{}_{pc}G}{e} \qquad . \; . \; . \; . \; . \; . \; . \; . \; (2)$$

This has its own importance and should be borne in mind in what follows.

16. We may now go over to the "natural" (or welfare optimum) rate of growth. This may be regarded as, in the main (see below), exogenously determined, viz., by the growth of population and technological advance. This includes the rate of growth of skilled personnel, however obtained, *e.g.*, by governmental measures. If we are considering the welfare optimum, we should write, $T = 1$. There ought not to be a time preference! Any authority concerned with planning should, presumably, disregard it. Putting $r\ (= R - 1)$ for the rate of interest, we then have

$$r_n = \frac{{}_{pc}G_n}{e} \qquad . \; . \; . \; . \; . \; . \; . \; . \; (I)$$

In other words,

$$r_n = \frac{G_n}{e} \Big/ G_{Pop}$$

where G_{Pop} is the rate of growth of the working population.

17. As G_n is (in the main) exogenously determined, and as e certainly is, equation (I) should be regarded as stating what determines the natural rate of interest.

18. It may be objected that G_n is itself determined by the rate of interest, so that there are two dependent variables in equation (I). This must be

[1] In the community equation T also must be taken to represent a weighted average.

recognised, subject to the important warnings given below, and, to accommodate the matter, we may have a second equation, showing the dependence of the natural growth rate on the rate of interest thus:

$$_{pc}G_n = f(r_n) \text{ (decreasing or increasing function)} \quad . \quad . \quad . \quad . \quad \text{(Ia)}$$

19. There is an inclination to suppose that G_n would be greater, the lower the rate of interest. As a generalisation, this is fallacious, and due to a confusion of dimensions, which it should be the first task of a "dynamic economics" to prevent. The confusion arises from regard to two quite different propositions, as follows: (i) If the rate of interest is low, more capital-intensive methods of production will be chosen by the producer, or more capital-intensive products will be preferred (because cheaper) by the consumer, than if it is high. The capital/output ratio will be higher. This means that, given the population and other factors (natural resources, trained personnel, etc.), output per person will be higher. It need hardly be said that higher production does not entail a higher growth rate. (Often the contrary!) (ii) If employment (including employment of skilled personnel) is not full, a drop in the rate of interest can increase it. While unemployed resources are coming into operation, G (actual growth rate) can exceed G_n. It need hardly be said that this does not entail a higher G_n either. It is quite an open question whether G_n will be higher or lower with a lower rate of interest. All depends on the nature of the technological innovations. If these are concentrated on substitute modes of production or substitute products where the yields on the modes and products for which they are substitutes are low, then the low-interest-rate economy will show a higher growth rate than the high-interest one. It will have the opportunity of taking advantage of a number of innovations which the high-interest economy has simply to ignore because, for it, they are outside the range of paying propositions. But if the innovations are such that the substituted processes or products were previously a long way inside the margin of substitution, the reverse may well be true. Compare two economies A and B of the same population increase, of which A uses more capital-intensive methods because its growth *per caput* and its natural interest rate are lower. A consequently has a higher income per head. Let there be an innovation available to both economies, which both will unquestionably adopt, because it is so manifestly high yielding. Thus for both it will cause the same increase in income in the sectors affected. But, because A is initially a higher-income economy, the growth entailed by this innovation will be greater in B, the high-interest country. Finally, there is the point that a *falling*, as distinct from a low, rate of interest could promote *per caput* growth. A falling *natural* rate of interest is a phenomenon of declining growth *per caput* (see para. 25). A fall in the interest rate from a supra-natural level towards its natural level is discussed in paras. 35–8 below.

20. The main objection to equation (I) is the difficulty of computing e.

It is supposed on general grounds to be less than 1. On the other hand, it would probably be wrong to suppose it *much less* than 1, since this would give an unrealistic decline in the marginal utility of income in the ranges of which we have experience. It would follow that the rate of interest ought to be above, but not much above, the growth rate *per caput*.

21. In *Towards a Dynamic Economics* (pp. 43–4) I suggested a method for measuring e. I proposed to take the eighth hour of work (or the sixtieth minute of the eighth hour) as a yardstick of constant disutility for a given individual. By appropriate conjoint variations in his basic rate of pay and his marginal rate (for the last hour or last minute thereof), and by allowing him freedom to vary the time worked, one could find out what increase in the marginal rate sufficed to keep him working exactly eight hours, neither more nor less, as his total income rose owing to an increase in the basic rate. It has been objected to this that a rise in income might make him find more utility in leisure, so that the sixtieth minute of the eighth hour would cease to be a yardstick of unvarying disutility, but would conflate the actual toil of work with the disutility of foregoing leisure, the latter rising as income grew. This objection could readily be overcome by varying the conditions of the experiment. Let us suppose the length of the working day not subject to variation, so that the rising utility of leisure, with higher income, became irrelevant. Let us suppose a piece-rate superimposed upon a basic rate, both variable. The target output, say 100 pieces, should be fixed so that it was quite a considerable effort to achieve it. What increase in piece-rates would be required to induce the man to produce exactly 100 pieces, neither more nor less, as his income went up owing to successive rises in his basic rate? This seems to give an inexpugnable yardstick for cardinal measurement of the rate of decline in the utility of income as income rises.

22. I have suggested applying the experiment to one individual to avoid interpersonal comparison. It will be objected that a single individual's reactions to changes of income—not known to be permanent, if this is a mere experiment—would be quite unreliable. In practice, of course, one would make the experiment with a *large number* of different individuals, who were normally on different income scales owing to their position in the factory hierarchy, and would rely on the large number to overcome differences of personal temperament from man to man. This is the way in which things are commonly done in the natural sciences. Of course, no such measurement could be relied on to be 100% accurate. It is impossible to get measurements of *perfect* accuracy in physics—I am not speaking of quantum physics—or in chemistry. The practitioners of those sciences would not have done so well if they had decided in consequence from the beginning to use no cardinal numbers in the formulation of physical and chemical laws. This is true of economics also.

23. It is next necessary to draw the threads together. The "supply"

equation, which should be regarded as determining the natural rate of interest, is

$$r_n = \frac{{}_{pc}G_n}{e}, \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (I)$$

where G_n is taken to be an almost entirely independent variable, but possibly depending to a slight degree upon the rate of interest:

$${}_{pc}G_n = f(r_n) \text{ (increasing or decreasing function)} \quad . \quad . \quad (Ia)$$

The capital intensity of methods used for increments of production, and of the basketful of goods selected by consumers for their additional purchases, depends on the rate of interest:

$$C_r = f(r_n) \text{ (decreasing function)} \quad . \quad . \quad . \quad . \quad (II)$$

This equation should satisfy objectors who complain that I took no account of the substitutability of capital for other factors in my earlier equation. And finally, to repeat the equation from the earlier *Essay* in a somewhat different form,

$$s_r = C_r G_n \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (III)$$

By this formulation the fraction of income to be saved becomes a *desideratum*, s_r.

24. Two points may be made in passing. In equation (III) the required amount of saving is stated as depending on the amount of capital required for the increment of output. But technical progress may alter, and often increase, the amount of replacement capital required per unit of output; it may also raise the required rate of replacements by rendering obsolete equipment hitherto expected to have a longer life. To take account of this it will be needful to re-work the theory that has been outlined in *gross* terms. This task is not attempted here.

25. This article is concerned with a steady shift of the "production function" outwards from the origin. It is not implied that the successive functions, moving outwards with time, are parallel to each other; the analysis has been consistent with innovations being neutral, labour saving or capital saving. Some students of growth have laid stress on the phenomenon of a movement *along* the productivity function in consequence, not of innovations, but of a rise in the ratio of capital to other factors due to the accrual of fresh saving. Such a movement implies a falling rate of interest (by Equation (II)). A falling natural rate of interest implies a falling natural rate of growth *per caput* (by Equation (I)), save in the event of e increasing, which seems improbable. Thus a shift along the production function, as distinct from a movement outwards of the production function, should occur only in periods when the rate of technical progress is falling. Such a shift may ensure that the rate of growth *per caput* does not fall as quickly as the rate of technical progress. None the less, it is essentially a phenomenon of a falling natural rate of growth.

26. To return to our main theme: it might be thought that, since e is a weighted average, s, the fraction of income actually saved would tend to approximate to s_r, the social requirement. There are a number of reasons why this may not be so, of which I will mention only the most outstanding. (i) T may be less, indeed much less, than 1, especially in developing societies. This would tend to depress saving. (ii) Individuals have their own youth–maturity–old-age patterns, which might cause them to save more or less than they would, if each was immortal and had an income continually growing at the same rate as the weighted average of incomes *per caput* for the economy. (iii) Companies save importantly. It would be wrong to suppose that these shape their policies to conform to the saving patterns required by the weighted average of their shareholders, or that the shareholders treat company savings as in effect their own, and save correspondingly less for themselves. Companies have their own motives, some springing from the long run; they may desire to expand capacity without the forfeit of power or the expense involved in relying on the capital market for fresh funds. The sharohelder, on his side, cannot be sure when the companies will distribute the profit on their ploughed-back savings, nor can those who determine current share values in the organised market for shares.

27. To revert to the terminology of the earlier *Essay*, the warranted rate of growth is above the natural growth rate, if actual saving (s) exceeds the required rate of saving (s_r), and conversely. While the natural rate of growth is determined almost entirely exogenously in relation to the variables of the equations and is therefore taken to *require* a specified amount of saving (s_r), the warranted rate of growth is taken to be determined by the actual rate of saving (s). Let us take the two cases, viz., an excess or deficiency of s compared with s_r, in turn.

28. If $s > s_r$, then we have the situation which Keynes diagnosed and about which he feared, along with other proponents of the "stagnation thesis." The warranted rate is then greater than the natural rate; but the actual rate cannot exceed the natural rate save for temporary phases. The natural rate is indeed the greatest that can be achieved on the long haul.[1] If the actual rate of growth is retarded by the full-employment ceiling, then it must fall below the warranted rate and a depression will set in.[2] Or a downturn can come, for reasons explained in an earlier article,[3] before the full-employment ceiling is reached, if producers correctly believe that demand cannot continue to expand indefinitely above the natural rate, viz., at its

[1] It has been suggested to me that this is not *necessarily* true, since, if the rate of interest were pushed and kept down *below* its natural level, a rate of growth above the natural level could in certain circumstances be sustained. This possibility must be recognised. It must be borne in mind, however, that a below-natural rate of interest may equally well be associated with a *lower*, as with a higher, rate of growth (cf. p. 283 *sup.*).

[2] This is in accordance with the instability principle, as described in the first *Essay*, and I need not revert to it in this one.

[3] "Domar and Dynamic Economics," ECONOMIC JOURNAL, September 1959.

rate in the recent past. The special circumstances of the post-war period have caused us to think less about the dangers of "stagnation"; but they may still be lurking, especially if the maximum feasible rate of investment in developing countries proves to be disappointing.

29. A suggested recipe for the threat of stagnation, in addition to stimulating all kinds of public investment, or other investments the utility of which might be reckoned to exceed their monetary yields, is a Budget Deficit. As Political Economists we should not wish to discourage the propensity to save. It may be useful to have a high propensity to save deeply ingrained, in case times should change. Furthermore, the ownership of some capital funds gives a man a special kind of happiness and a sense of freedom. Without property we remain, although not in so severe a sense as Marx may have intended, wage slaves. Ownership promotes a spirit of independence. And so, if it happens that the sum total of citizens desire to hold, in the form of savings available for future use, a value greater than the sum total of the capital value of the land, buildings, equipment, work in progress, stock-in-trade, etc., that the community requires, the Government should provide reliable savings certificates. It is essential, of course, that in such a situation it should treat the proceeds of the sale of such certificates as income and remit taxation accordingly, with a view to sustaining the aggregate of demand for goods and services at a level conformable to the growth potential of the economy.

30. I made a cardinal mistake in *Towards a Dynamic Economics*, owing to still being sunk in static slumber. It occurred to me that, if saving were really so plentiful that the Government had to take a surplus off the market and plough it back into current expenditure, the logical corollary of such a state of affairs was that the rate of interest should be zero. If interest is the charge for a scarce factor, the economic function of which is to prevent capital being used for low-yielding projects and ensure that enough exists for all the higher-yielding projects, what need was there to have a positive rate of interest when revenue-yielding projects for capital outlay were so short that one had to plough saving back into public expenditure on current account? This point of view is plausible enough. But in the light of equation (I) it is seen to be wrong. If $\frac{pc}{e}\frac{G}{} = 3$, it does not increase community welfare to plough savings into projects that yield less than 3%. We do not want by investment to transfer goods away from present consumption to consumption in subsequent years, if the investment increases the quantum of goods available in the subsequent years by no more than 2%. For the marginal utility of goods will in any case be down by 3% in the next year and by more later; therefore we do not want to give up the enjoyment of goods now unless we thereby get at least 3% more goods in subsequent years. Therefore the maintenance of a positive rate of interest is not inconsistent with the desirability of ploughing back some savings into current government expenditure, not merely

in depression, but on the overall average year by year, providing that productivity per head is still growing. A positive rate of interest should be maintained, even when some savings are being made available to the general body of citizens for current expenditure, in order to prevent savings being ploughed into investments the yield of which is less than the current natural rate of interest, $\frac{{}_pG_n}{e}$. The rate of interest should fall to zero only if output per head ceases to grow and ${}_pG/e$ becomes zero.

31. If $s < s_r$ the economy may have a chronic tendency to inflation. This occurred for a number of years in mature countries after the Second World War, and it may explain the persistent tendency to inflation in some Latin American countries. For such inflation to occur there is no need for there to be any increase in banking credits; the excess investment, if it occurs, is automatically financed by the excess (inflationary) profits due to the investment. This is a crucial point that divides anti-Keynesians from Keynesians, in the dwindling band of whom I would still align myself. None the less, I would not go so far as to hold that in these circumstances (viz. $s < s_r$) an inflationary tendency *necessarily* develops. The realisation of excess investment seems to imply, not indeed an increase in banking credit, but an accommodating spirit in the capital market. Developing countries may have a very narrow domestic capital market, or none, save for a tribe of "usurers" lending at exorbitant rates. In mature countries investors can usually pre-arrange finance, even if the total amount so arranged is running ahead of normal savings, *i.e.*, if there is excess of *ex ante* investment; if they do so and proceed on their business the aggregate of savings that they require will become available *en courant* through the inflationary process. But where capital markets are narrow or non-existent it may be impossible to make these pre-arrangements; the inflationary finance will not be generated and the investments will not be undertaken. Lack of saving will prevent the growth that would otherwise be possible.

32. It may be well to dwell a little longer on this point. The Keynesian scheme of thought had an attractive symmetry. If the propensity to save was excessive in relation to the propensity to invest, there would be a lapse into depression and unemployment. In the converse case there would be over-full demand and inflation; this second proposition seemed well confirmed by experiences in war-time and, to a lesser extent, during industrial investment booms. But somehow it has never seemed very plausible in relation to developing countries. There over-full demand does not usually arise in consequence of a deficiency of saving. In fact, the tendency of deficient saving to generate over-full demand must not be taken as a general law, but one dependent on the existence of an accommodating capital market, which allows the process by which excess investment generates the saving required for it (by the inflationary process) to get under weigh. Nor would the introduction of easy finance into developing countries be a satis-

factory recipe, since inflation is something to be avoided and likely to militate against growth in the long run.[1] The true view surely is that, to obtain the optimum rate of growth, which is also in some sense a maximum, saving must be neither redundant nor deficient.

33. It is necessary to look closely at the equation, $s_r = C_r G_n$ when $s < s_r$. It might be thought that the dearth of savings would push the rate of interest up so high as to reduce C_r to a level at which G_n could be sustained. But this may not be so. C_r may not be very responsive, outside certain limits, to a high interest rate. Even if it is, there is no guarantee that it is sufficiently responsive and, more important, no guarantee that the brunt of the shortage of savings will be borne by C_r rather than by G, which can fall below G_n. If the actual growth (G) falls short of the natural growth (G_n), the demand for goods will be deficient and the shortage of savings will not be apparent. If, owing to the lack of demand for goods, producers do not expand orders, G will be low and there will not be inflation nor a felt shortage of savings nor any tendency for the rate of interest to rise.[2]

34. It is desirable to surround any remarks about developing countries by qualifications. The major obstacle to growth may well be lack of personnel or, to revert to a point mentioned earlier, graft. The concept of natural growth embodies not only technological progress but also the increase of personnel well adapted to enterprise and business management, and the increase of know-how, whether natural or artificially stimulated. Shortages in these respects may account for a low growth rate, rather than any deficiency of s, compared with s_r. If, on grounds of personnel and know-how, a rapid growth is not feasible, s_r will be low, and s, though low, may not fall short of it.

35. None the less, it is desirable to consider the case where s is below s_r and where inflation does not occur because the capital market is insufficiently accommodating. In such a case, to obtain the social optimum, it may be expedient to raise s towards the level of s_r by a budget surplus or compulsory levy. If such measures are introduced *for the first time*, or abruptly intensified, there will follow what we may call a "transitional period." If actual growth has been running below natural growth, solely by reason of the shortage of saving, this entails that there is some underemployment or mis-employment of general or special personnel; output may be low because the capital/output ratio is low owing to the time preference being high (T low). If it were decided to take some action to remedy this state of affairs by causing more saving, then the economy would proceed through a transitional period in which actual growth was above natural growth, owing to the harnessing of previously under-employed personnel and/or owing to the increase of the

[1] See Ohlinschrift, *Inflation and Investment in Under-developed Countries*, by R. F. Harrod (1959).

[2] It will be evident to the judicious reader that this point, although entirely outside the ambit of Keynes' theories, is profoundly influenced by his mode of thought. It is analogous, within the realm of dynamics and in reverse, to Keynes' point that, if the *propensity* to save is excessive, causing depression, there will not be any felt excess of saving nor tendency for the rate of interest to fall.

capital/output ratio in various sectors of the economy, through the reduction of the operative rate of interest towards r_n.

36. The features of such a transitional period lie for the most part outside the scope of the analysis of this paper. But some general remarks may be made. Since growth during the transitional period would be above the natural rate, which implies continuing full employment, the equilibrium rate of interest, assuming $T = 1$, during the transitional period (let us call it r_{tn}), would lie above r_n. Often the ruling rate of interest in developing countries, if there be such, is above r_n owing to the low value of T. Cf. equation (2) (p. 282). On the other hand, the equilibrium rate in such countries is kept down by the low rate of growth. Thus it might, in certain conditions, be expedient to establish, during the transitional period, a rate of interest above that previously obtaining. This may seem a paradoxical accompaniment of the imposition of forced saving. But if the special measures taken raise the prospective growth rate, this will temporarily raise the natural rate of interest (r_{tn}) (equation (I)), and may raise it above the rate previously obtaining, except in economies where T is very low. In a developing economy there may be two rates, the high open-market rate, such as it is, largely governed by the low value of T, and a lower rate used to sieve official investment projects. It is important that the latter be kept high, to ensure the maximum rate of growth and prevent capital being deflected into low-yielding projects.

37. It is often stated that developing countries, which are short of capital, should concentrate on labour-intensive projects. This dictum can be accepted only with reserve. Its intellectual basis is presumably that, if $s < C_r G_n$, and if measures are taken to raise s, it is important that the accretion of s should benefit growth rather than C_r. All depends on how great the shortfall of s (by comparison with s_r) is in relation to available personnel and know-how. There is a danger of this shortage being exaggerated if constant attention is not paid to personnel and know-how. If the shortage is not great and if it is feasible within a relatively short term of years to bring capital disposal up to the level required, having regard to available resources of personnel and know-how, then the criterion for investment should be its *yield* and not whether it is capital-intensive or labour-intensive.

38. While it is true that the arrangement for extra saving in a developing country may give rise to a substantial " transitional " period, there is some danger of exaggerating its importance. If at a given point of time, t_o, growth is running below its natural rate through lack of saving, this implies that there is available personnel to implement improved methods of production, including those arising simply from an increase in the capital/output ratio. It is the process of bringing this personnel into fuller play that constitutes the " transitional " period. But there is not likely to be at t_o more than a limited fund of such personnel to spare; once that is taken up, " transitional " growth is merged into ordinary natural growth. It is quite

true that, if in the country in question growth has been held back for a number of years owing to deficient saving, its current output at t_0 may be far below the level, let us call it O_n, at which it would have been, if growth had been proceeding at its natural rate in the preceeding years. It by no means follows that an arrangement for extra saving at and after t_0 can raise output to O_n at once or during the "transitional" period. For natural growth *per caput* occurs through the cumulative accretion of experience and know-how and the improvement of personnel. *Lost years cannot be regained in full.* The very essence of growth (*per caput*) is education by practice and the gradual drawing out of the latent potentialities of personnel. *Vires acquirit eundo.* From t_0 onwards it is to be expected that, with the provision of more saving, growth will be raised to a higher level, namely to its natural level, the height of which depends essentially on the capacity of the population to improve itself.[1] The compulsory provision of extra saving should be regarded as releasing the growth potential of the community from bondage. It is important to avoid over-simplified ideas about the consequences of the mere provision of additional saving. This view might be regarded as pessimistic, in that it sets a limit to what can be done by one simple recipe (more saving); but it is optimistic in that it enables us to curb the impulses of those who believe that Utopia can be gained solely by the imposition of harsh austerity.

39. In mature economies also s may fall short of s_r, and this may generate demand inflation, as already noticed. But the authorities may and should seek to prevent demand inflation. Their problem is complicated by the superimposition of cycles on the trend. During the boom all available measures, monetary, fiscal and others, may be needed to damp demand. Monetary measures are probably quicker-working than fiscal. Similarly, all available measures may be needed to prevent a recession gathering momentum. What should be the trend of policy, taking bad times and good together, when actual saving is running below the required level?

40. Keynes and others have held the view that the current long-term rate of interest can be influenced by varying the quantity of money. This has been strikingly borne out by the British experience since the War. Keynes explicitly repudiated the idea of a natural rate of interest. Both Professor Hicks and Sir Dennis Robertson have reproached him for this, the former saying that he left the rate of interest hanging by its own boot-straps,[2] and the latter making a similar point in a brilliant passage—claiming that we have, after all, to give it an anchorage in the fundamental phenomena of Productivity and Thrift.[3] Despite Keynes' disclaimers, I have always held that there is a "natural" rate of interest implicit in the doctrines of the *General Theory of Employment, Interest and Money*, namely that required to sustain investment and aggregate demand at the full-employment, and at no

[1] This is subject to the limitation imposed on the analysis of this article, which relates to an insulated economy and thereby excludes the international flow of capital and know-how.

[2] *Value and Capital*, second edition, p. 164.

[3] *Essays in Monetary Theory*, p. 25.

more than the full-employment, level. If we ask what are the determinants of the value of that "natural" rate of interest in Keynesian theory, the answer must be the Propensity to Invest and the Propensity to Save, the latter determining the value of the "Multiplier." But these are only other names for Productivity and Thrift; so that it turns out that the classical doctrine finds its place in Keynesian doctrine. Keynes was, after all, bred up in that tradition.

41. But the natural rate of interest of the dynamic theory expounded in this article, and by that is simply meant the rate of interest that it is necessary to have if the economy is to advance at the optimum rate in accordance with its growth potential, is determined by the prospective growth of income and the elasticity of the community income utility curve (equation (I)). Thus this dynamic theory is in sharper conflict with Keynes than ever Keynes was with Robertson.

42. Let there be a situation in which s is less than s_r and it is desired to prevent a chronic tendency towards demand-inflation. Classical theory suggests that a rise in the interest rate would be desirable, so as to reduce investment demand and, possibly, encourage saving. But some voices can be heard from the wings suggesting that there is also something called a "fiscal" remedy—or is this allowable only to control the cycle? The voices may suggest that a Budget surplus would be better than a high interest rate, since a high interest rate bridges the gap mainly by lowering investment requirements, while the budget surplus bridges the gap mainly by raising savings. And is it not better to raise savings than to reduce investment requirements? But is it better? Was there discernible, in the voices off, a note that would be condemned by Mr. Little, something persuasive, something emotive, possibly even a "value judgment" itself? Dynamic theory should enable us to resolve the issue on purely rational grounds.

43. Happily in that theory the natural rate of interest is determined independently of the demand for or supply of savings, present or prospective. If we can make approximate guesses about the growth potential per head (*i.e.*, ${}_{pc}G_n$) and the elasticity of income utility, then we can determine what rate of interest is consistent with that. I must not be supposed to be here deprecating such manipulation of the interest rate as may serve to iron out booms and slumps, *i.e.*, to prevent actual growth running away in either direction from a steady path. I am referring now to the average interest rate in both phases taken together. If the actual rate seems low by the criterion of the formula, then there is a case for raising it. (Raising the interest rate should be taken to include making borrowing difficult in imperfect markets.) This may indeed render some investment projects unpayable, but only those whose yield is so low that from the point of view of the social optimum they are undesirable. But if there is no reason to suppose that the rate is below its natural level as defined in equation (I), *then there should be resort to a Budget surplus.*

44. I may interject a topical observation. I deem it unlikely that Britain will be subject to chronic inflationary pressure on the demand side in the coming decade. But if I am wrong, the evil should be cured by a Budget surplus rather than by any further raising of the interest rate. And indeed, unless national income per head is destined to grow at a much greater rate in the coming period than it has done in the last decade, it would be surprising if 5% were not considerably too high.

45. What has been said is not inconsistent with the idea of easing a transition period by a high interest rate. Reference to such a period has already been made in relation to developing countries, where it may be a phenomenon of substantial magnitude. Big transitions are less likely in mature countries, but not impossible. Suppose a very large capital-requiring innovation. This will raise required saving by raising C_r. The innovation may also affect the nature of replacement equipment and indeed raise the required rate of replacements (cf. p. 285 *sup.*). In fine, the change in a dynamic determinant will have considerably raised the requirement for saving (s_r). The rise in the requirement may be permanent or it may not be, that depending on the nature of future innovations. In the former event it might be expedient to ease the transition by allowing a temporary rise in the interest rate rather than by jacking up saving too suddenly and abruptly. But if the rate is raised above its natural level to ease a transition, the target should always be to reduce it again to that level at an early date.

R. F. HARROD

Christ Church,
Oxford.

THE SOCIAL ANTHROPOLOGY OF ECONOMIC UNDERDEVELOPMENT

In this paper evidence is submitted to support the thesis—which has evidently been gathering force during the past few years—that the economic condition of the underdeveloped community is fundamentally a function of its social–cultural customs and institutions, in consequence of which the generation of economic development of a people by themselves [1] is neither more nor less than a socio-psychological process. This represents a "venture into the preserves of other social scientists" as Belshaw puts it,[2] but it is a venture which economists can ill afford not to undertake.

Although our conclusions are based on a study of a specific African people in the southern part of the continent, it is believed that their validity is not thus restricted.

The People and their Economy

The underdeveloped people in question are South African Bantu, approximately 4,500,000 in number, scattered over 58,000 square miles of territory, called Bantu Areas, which adjoin the areas constituting the developed sector of the South African economy. Nowhere in the Bantu territories do the concentrations of population assume the proportions or the character of a town in the customary sense of the word. The natural rate of population growth, at 1·6% per cent per annum, is the result of a high fertility rate, limited to some extent by the observance of the traditional custom of spacing, and a fairly high rate of mortality. The growth of their numbers is not prescribed by the ability of their economy to accommodate an increased population, since the adjacent developed sector takes care of the overflow.

For all practical purposes they can be described as an exclusively agrarian people. Ninety-two per cent have a stake in the land, which, compared to that of the developed sector, is mostly of a good quality and has for the greatest part the benefit of very favourable climatological conditions. By the standards of the surrounding developed areas this land could yield at a minimum £90 million worth of agricultural production per annum. In actual fact the value of the annual production varies around £13 million,[3] and has shown, until quite recently, no increase since the time the first

[1] The qualification "by themselves" is necessary, since it is conceivable that an underdeveloped people could be developed by means of factors of production from developed economies.

[2] Belshaw, *Population Growth and Levels of Consumption* (Allen and Unwin), 1956, p. viii.

[3] This is in terms of conventional calculation. When the calculation is in terms of the amount of products consumed, which include certain plants, roots, small animals, etc., found in the fields, and the meat of cattle and other animals which died, the figure can be put at approximately £30 million.

statistics have become available. As the subsistence farming does not provide adequate sustenance for the population, their income is supplemented by wages earned during intermittent spells of work in the developed sector. These and other contacts with a developed economy have had some effects on the life of the African communities which will be described at a later stage. Thus far they have, however, made little impression on the traditional social and cultural habit patterns which inhibit economic progress.

The Traditional Setting

The tribe, which is based on a nucleus of families descended from a common ancestor(s) (as the result, among some tribes, of fairly rigid marriage rules calculated to strengthen mutual ties) and which has a chief as its binding force, is the social unit. Since chieftainship is an inherited status, the chief is often not endowed with the attributes of a leader. The mental horizon of the people is limited by their allegiance and loyalties, which extend no further than the tribe, and is directed towards the smaller family group in the first instance. The latter forms the economic unit, which is self-contained. Intra-tribal trade is negligible; inter-tribal trade is non-existent. No indigenous medium of exchange had been developed, since there was no need for it. Theirs is the well-known subsistence economy.

Their agriculture has evolved in circumstances in which no store was set by the long-run fertility of the soil because movement to new territory was always possible, and in which the male adult occupied himself with hunting and warfare. Thus the cultivation of the soil became primarily the responsibility of the mother of the family, assisted to some extent by her children. Assistance by the husband is an exception. He and his sons tend the cattle, sheep and goats. It is not good form for the man to " burrow " in the soil. The effect of this custom on agricultural productivity must be obvious.

The success of a crop is promoted by means of ceremonial rituals in which the aid of magic is invoked. The seed may be specially treated by the chief, who may also determine the time of planting and sowing in accordance with the witch doctor's reading of the constellations. Rituals are performed to ensure adequate rain, and certain taboos are to be observed to prevent failures or catastrophes. Thus the manipulation of supernatural forces in the interest of the cultivator takes the place of methods which harness the forces of nature to increase productivity. Instead of using manure as a fertiliser, it is dried and used as fuel. Once again the consequences are obvious.

Stock-breeding, in which cattle predominate, is a way of life: its economic functions are completely overshadowed by its social significance. To each person, while still young, is assigned a specific steer, whose praises will be sung in songs dedicated to it and which may be sacrificed when the person

to whom it has been assigned falls seriously ill, or as a means of keeping on good terms with the ancestral spirits. " The God with the wet nose " it is called in one eulogy. Cattle are very seldom slaughtered for consumption in the ordinary course of events. That is mostly reserved for ceremonial and ritual purposes. In so far as the population does consume a fair amount of meat, it is because the carcasses of domestic animals which have died are not wasted, unless such animals constitute the totem of the tribe. The number of cattle determines the status and dignity of the owner, since it allows him to dispense hospitality and generosity, to repair strained relations and to generate good relations among the living and between the living and the dead, and to procure wives. Cattle are the traditional media for the payment of " lobolo," *i.e.*, the goods to be handed over by the family of the bridegroom to the family of the bride when a marriage is contracted. The more cattle in a person's possession, the more wives he can afford.

In these circumstances it is the quantity of animals that is important, not the quality. For all the functions decimated animals will be as appropriate as any other. Scrub cattle, overstocking, denudation of the veld and soil erosion are the inevitable outcome. Capital formation through a process of increments in the value of the stock is obviated.

As an integral part of their culture, many habits and customs are calculated to promote the propagation of children. Although most marriages are monogamous, it is partly so because the majority do not have the necessary " lobolo " at their disposal to enter into polygamous unions which are the accepted system. The consummation of the marriage is in the procreation of children; girls are the means whereby the family increases its stock of cattle when they are old enough to marry. Procreation is the fundamental condition attached to marriage. Large families are regarded as good performance. Its realisation is promoted by the system of " lobolo." If the bride is barren, or dies young without issue, a sister or younger relative may in some tribes be supplied to make good the deficiency. A widow may be assigned to a younger brother of her deceased husband so that she can propagate children for the deceased. Apart from the economic effects arising from the size, growth and composition of the population, these customs make for limited interests, diverting the attention and endeavour from the pursuit of other, including economic, ends.

In their religion these Bantu communities are ancestor-worshippers. The ancestors act as the mediators between human beings and the supreme Being (God), who has the power of life and death and brings prosperity to, or visits catastrophes upon, human beings, and must be accorded the necessary offerings to prevent their anger. This religion is anti-rationalistic; it is antipathetic towards a spirit of inquiry and demands only conformism. It is not a stimulus to a higher level of material well-being. The *summum bonum* is the honouring of the traditional usages and beliefs. Their own system of education, which amounts to the instruction in age-old customs, mores and

institutions, ensures the transmission of traditions from one generation to the next and the perpetuation of the inherently conservative culture.

In sharp contrast with the individualism which characterises all or most Western peoples, and which has been an outstanding factor in their economic development, the tribal people form organic and integrated societies with a strong community-consciousness, and in which the rights and obligations of the individual are well defined and adhered to. Mutual ties, interdependence and responsibility are established by the system of consanguinity, worshipping of the same ancestors, the possession of the same totems, the system of land tenure and other institutions. Social care is the responsibility of each and all, extending from the family through the household and the family group to the whole tribe. There are no special institutions to cater for the poor, the hungry, the sick, the disabled and the aged. They are cared for by the more privileged. Thus the community guarantees the security of the individual. Mutual aid is extended on numerous occasions, such as the harvesting of crops, the building of huts, weeding, etc. A person may lend-lease part of his wealth to a less-privileged neighbour to enable him to make a better living. Food, housing accommodation and other living arrangements will always be shared with the most distant of relations, even if the latter are strong and healthy and able to fend for themselves but do not feel inclined to do so.

Community-centredness and the absence of individualism are nowhere more strongly reflected than in their economic system. Land is communal property, administered by the chief or headman. For each wife the husband is granted a piece of land for the growing of crops, and each has the right to graze his cattle, sheep, goats or other animals on the commonage. They prosper together and they go hungry together.

However commendable the social security which arises from this type of socio-economic organisation, it is inimical to economic development. It obviates, or greatly diminishes, the necessity for continued personal exertion. Social care and mutual aid coupled with a low standard of living mean that the disappearance of a source of income, or of personal earnings, does not have the significance for the individual it would have in an individualistic culture. Friends and relations can be relied on to come to the rescue or shoulder the extra burden. The progressive individual can never be sure that he will be able to enjoy in full the fruits of his own exertions. If some were to cultivate their piece of land better than the others the increase in the crops would be shared by others; if they improve their land the improvements do not become a negotiable commercial asset. Communal grazing severely limits the possibilities of scientific husbandry by individuals.

A philosophy of life which sets little store by an abundance of material things fits into this social setting. Their needs are relatively few. There is no strong urge to attain ever-increasing standards of material welfare. They do not have the acquisitive instinct. An increased standard of living is

preferably realised in the form of greater leisure. Although the backward-sloping supply curve of effort is not unique to the tribal Bantu, the backward movement starts at a fairly early stage because of the limited and inelastic demand for income The equivalence of marginal utility of income and the marginal disutility of effort is reached very soon. Nourishment that can be obtained from wild fruit and roots in the fields need not be earned in other ways. There seems to be at the back of his mind some doubt about the necessity and sense of all the urgency, striving, efficiency and high-speed activity of modern industrial life. Work for its own sake is not part of this scheme of things. We have here all types of under-employment imaginable: visible, disguised and potential, and most of it voluntary.

There are in this society no distinctive social classes stratified according to income. In the result a factor is missing which could have acted as an incentive to economic advancement as a means towards social advancement.

A characteristic which more than anything else distinguishes the tribal people from technologically developed communities is the absence of a regard for, and concern about, the future. "The lobotomised personality" —in the phraseology of the psychologists—would not be an inappropriate term in this connection. The future as a concept which elicits action is not part of their culture. The "sufficient unto the day" approach does not make for an inclination to accumulate for the sake of sustaining life at some future time. It is not an unknown phenomenon that good crops in one season may lead to the abstention from ploughing and sowing during the next. This has serious implications for capital formation: there is no, or little, purposeful accumulation of capital. More than that, it means that capital goods put at their disposal are not maintained but allowed to fall into disrepair, without being used as the basis for further capital formation. Maintenance of the fertility of the soil for future production is not a consideration.

In the search for a meaningful definition of the term "underdeveloped community," the above characteristic could be used as a strategic explanatory factor.

In the light of the above and with peace and quiet—except when interrupted by faction fights—representing the dominant note of tribal life, it is not surprising that psychologists find them lacking in self-assertiveness, self-confidence and initiative, and in ability to organise, to plan a course of action and to put plans into action. Understandable too is the deficiency in their psychomotor attributes, which may be in the receptor mechanism—the organising process dealing with the incoming data—and/or in the motor or effector mechanism—which translates perception or assimilation into muscular movements. In the absence of daily contact and acquaintance with the devices of technological civilisation, the actions and experience which can attune the psychomotor mechanism to the requirements of industrial development are lacking. The realisation of their innate intel-

lectual capacities, which are no doubt on a par with those of other peoples, is inhibited by the totality of environmental influences.

The Transition

Change-inducing factors have been introduced into tribal life as a result of contact with the developed sector and its technological culture. The contact is established, directly, through the periodic temporary emigration of men to industrial towns and cities in the surrounding area, and, indirectly, through the missionaries, traders, civil servants, teachers and development personnel who endeavour to transmit the ideas, knowledge and procedures of the technological civilisation to the people. Of the two channels of contact the former appears to have been, outwardly at least, the more potent. Periodically subjected to the individualistic, rationalistic urban culture, they return to their homelands to find the traditional ties and mores irksome. Their protest is in the first instance directed against parental and tribal authority, either because they have come to dislike authority *per se* or because they consider the persons concerned as too orthodox. Some leave the tribal areas permanently; others retain their domicile, and for them the migratory labour system becomes part of a way of life until the "retiring" age—just after forty—has been reached. In the long run this contact, reinforced by the presence and endeavours of representatives of the developed sector, has an influence which extends over a broader front. But the effects have not been so radical or fundamental as to reach down to the roots of economic under-development.

The development personnel who have been trying to change the economic habits of the people have had a hard and uphill struggle, and their success has been slow in coming. The all-pervading social climate remains a powerful counter-force. Grafting new economic habits on to traditional tribal culture does not lead to abundant growth, where the indigenous underdeveloped agricultural entrepreneur is to be harnessed as the leader in economic change.

The most marked changes induced by the contact with the developed sector have been in outward appearances of an imitative character. Clothing habits, consumption patterns and housing styles have changed to a considerable extent; technologically more advanced implements are being used in the home and on the lands. These are the most conspicuous elements in the technological culture; they can be visually appreciated and are therefore most easily adopted. The new needs which have evolved in this way spelled the end of the self-sufficiency of their economy. The amount of trading has increased. Much of it is still barter trade, but money as a medium of exchange and as a store of value is growing in importance, and the money sector of the economy is gradually expanding. A class of tradesmen emerged which grew in size as the policy of protection of the

" infant entrepreneur " took effect and the entry of general dealers from the developed sector was limited or prohibited. By ordinary standards this new class is not very successful as yet, hampered as they are by the lack of experience and know-how. But as a means of initiating change it is a most useful agency, inasmuch as some members of the underdeveloped people assume the strategic role, however inadequately, of entrepreneur outside the traditional agriculture industry, and help to increase the size of the market sector and to transform the subsistence economy into a money economy.

The acquired needs also act as a incentive to earn more cash. Encouraged by stock fairs which are specially organised for them, they participate in the selling of cattle on a small scale, while some have proceeded to the slaughtering of animals for commercial purposes. Even so, for the greatest part the necessary cash is still obtained through the performance of wage labour in the developed sector.

The impact of the new habits has, by and large, not extended to the pattern and mode of production. While the men tend to give some aid in the cultivation of the soil, women and children still constitute the predominant labour force. Cattle retain their attribute as a most precious possession. Culling is not yet generally and spontaneously accepted and practised, and soil conservation remains the obligation and function of the developing authority. While some inhabitants are prepared to pay high prices for certain vegetables and other foodstuffs, the prices do not stimulate production of these goods by themselves, even though there is no climatological or physical reason why they should not do so. They prefer to adhere to their traditional crops. Where the agricultural yields are above the average it is invariably a function of the degree of supervision by the extension officer and the aid given by the development personnel in the actual ploughing, sowing and fertilising.

It is not an unusual experience for the agricultural officers to have to persuade the peasants who have been allocated land in new irrigation schemes to start planting every time a new season has arrived.

Neither is it unusual for the Bantu who is employed as demonstrator to instruct his people in all the principles of scientific farming, but to ignore completely all these principles, and to revert to the traditional methods when cultivating his own plot of land.

The institution of private individual tenure of land, where it was experimented with, did not meet with the success hoped for. Very often the land thus allocated became overcrowded with " relations," some of them very distant ones, who attached themselves to the household of the owner or occupier. Evidently the superimposition of private tenure on a communal-tenure habit pattern cannot make for a great measure of success. Farming does not gain either by the facilities for formal education and training. The vast majority who go through school, even those specially trained for agricultural pursuits, shun this industry. The prevailing view among those

who have had four or five years of schooling seems to be that they have been adequately prepared for " white-collar " jobs and that manual labour does not have the necessary status to match their education.

As the activities of the development personnel increased, so did the dependence of the inhabitants on a distant body, " the government," as represented by the personnel. Rather than assume the responsibility for soil conservation, the maintenance of wire fences, of boreholes, etc., it was much more comfortable to leave it to the authorities. The phrase " that the government be respectfully requested " invariably prefixed the motions introduced in their Councils. In fact, the untiring efforts of the developing authority rather than those of the inhabitants themselves have been responsible for the measure of development that has taken place.

There has been no fundamental change in the social structure, habits and institutions of the people. Although nearly half of the population has been converted to the Christian faith, superstition has not lost its grip. The youth is still educated in the customs, mores and folk-lore of the tribe, and is required to conform. Polygamy, though diminished as a result of the missionaries' influence and of economic pressure, is still practised. The system of lobolo, though disliked by the younger generation and often paid in the form of cash instead of cattle, has been retained. Stock-breeding has largely remained a way of life rather than become a commercial activity, even while the quality of the animals has been improved.

In so far as there has been some change in their philosophy and way of life, it has been confined to the fringes of society. These fringes have not yet produced a body of economic leaders sufficiently strong and experienced and willing to act as initiators within tribal society, to set a cumulative process of change in motion. In other words, the exogenous factor, in the form of the outside body of developers, has not yet engendered a virile endogenous factor, the repercussions of whose activities could permeate the whole of society, which is caught up, economically speaking, in the fetters of its own traditional culture. The social and cultural milieu has proved to be very intractable and has retained its predominance.

Conclusions

There is much to be gained, and many misconceptions can be avoided, if the economic problem of an underdeveloped community of the type described above is framed, not in terms of the vicious circle of poverty, Malthusian pressure or inadequate capital formation, etc., but in terms of the strategic factors of an ultimate character, namely its social and psychological inertia. Here economic elements as such are not limiting factors of the first order; by assigning them to the category of mediate factors, the accent is put where it should be, and the difference between the underdeveloped and the developed community is clearly pointed up. In the latter the human material can be taken for granted in the sense that it can be assumed

that various economic stimuli will evoke fairly definite reactions; and on the basis of this assumption economic progress can be considered a function of economic factors in an ultimate sense. Even if changing psychological attitudes cannot be ruled out as causal factors in the developed economy, they are of a nature completely different from those obtaining among some underdeveloped peoples.

Economic development of an underdeveloped people by themselves is not compatible with the maintenance of their traditional customs and mores. A break with the latter is a pre-requisite to economic progress. What is needed is a revolution in the totality of social, cultural and religious institutions and habits, and thus in their psychological attitude, their philosophy and way of life. What is, therefore, required amounts in reality to social disorganisation. Unhappiness and discontentment in the sense of wanting more than is obtainable at any moment is to be generated. The suffering and dislocation that may be caused in the process may be objectionable, but it appears to be the price that has to be paid for economic development; the condition of economic progress.

If economic progress is deemed desirable and necessary and policy is to be formulated to achieve this end, the cart could in a certain sense be put before the horse in that economic changes can be utilised to generate the social revolution. Such a policy requires an outside agency or agencies from the developed countries which are prepared to supply the entrepreneurs, the capital and the highly skilled technical labour, who will take the initiative in establishing enterprises in the secondary and tertiary sectors. Providing the capital without the entrepreneurial initiative and managerial abilities to direct its economic exploitation will only lead to the waste of such capital. These agencies are to introduce the elements of technological culture into the pre-industrial societies. The industrial and business enterprises, which draw the underdeveloped people into their labour force and provide opportunities for them to rise in the hierarchy of the organisations, bring them into contact with new ways of doing things and new ways of life and standards of living. They should form the nucleus of urban development. The milieu of the town and city is *par excellence* conducive to a break with tradition, and as the ideas and values evolved in the industrial city permeate through the surrounding rural areas, the attitude of their inhabitants towards farming tends to change, so that it is no longer regarded only as a way of life and a means of supplying a minimum of subsistence. In particular, the proximity of a regular market in the form of the town or city will foster the growing of cash crops.

This approach, which could be termed "development from above," implies that the development of the underdeveloped people is not generated by themselves, and does not emanate from within except in so far as the outside agencies have been brought in at the request of the leaders of the underdeveloped community; which request can be taken as a reflection of

the desire for economic development. However, this exogenous factor is used as a means to spark off an endogenous process of growth. To attain this effect and the ensure the self-perpetuation of the progressive disequilibrium, the policy of " development from above " must be accompanied by a policy of " development from below," which involves the measures usually applied in the community project approach.

What needs to be stressed in the implementation of the latter policy is the indispensability of the services of the social anthropologist who has made a thorough study of the community concerned in each case. Not only should he be able to give advice on the basic growth-inhibiting factors and thus to indicate the strategic elements that have to be influenced, but also to make recommendations regarding the *modus operandi* which will yield optimum results. Thus the waste of much effort can be prevented.

J. L. Sadie

University of Stellenbosch,
South Africa.

THE FORWARD POUND 1951–59

To avoid later confusion, I begin this article with some assumptions and definitions. I assume there are only two currencies, the pound and the dollar; two interest rates, British and American three-month rates; and one forward rate, the three-month-forward rate.

Then:

(1) Pounds are sold spot for dollars when the currencies are exchanged immediately on the completion of the deal.

(2) Pounds are sold forward for dollars when the currencies are exchanged when some stipulated time has elapsed from the time the parties entered the contract.

(3) The spot rate is the number of dollars received for one pound spot, the forward rate the number of dollars for one pound forward.

(4) The forward rate is often expressed in the form of a discount or premium with respect to the spot rate. If the spot pound buys more dollars than the forward, the forward pound is at a discount equal to the difference between the spot and forward rates; if the forward pound buys more it is at a premium. The discount or premium on the forward pound may be expressed as a per cent per annum of the spot rate.

(5) The " interest parity " value of the forward pound is that value of the forward pound which, when expressed as a per cent per annum of the spot rate, is equal to the difference between the British and American interest rates. If the British rate is higher the forward pound will have to be at a discount to equal its interest parity, and at a premium if the American rate is higher.

(6) The " intrinsic discount or premium " on the forward pound measures the difference between the actual forward rate and its interest parity value. Suppose that the spot rate is $\$2.80 = £1$, and the interest rates are equal, then the interest parity is also $\$2.80 = £1$. If the forward rate is higher, say, $\$2.81 = £1$, the forward pound is at an intrinsic premium; if it is less there is an intrinsic discount. Thus the intrinsic discount or premium is the forward rate expressed from the origin of the interest parity. If the forward rate is above the interest parity there is an intrinsic premium, if below a discount.

I now wish to look at the forward exchange market and attempt to fit the various types of demand and supply for forward exchange into two demand–supply schedules. To do this, it is necessary to consider in turn

the various types of demand and supply of forward exchange. It is possible to distinguish four types.

(1) *Speculation.* Speculation in the forward market involves the sale of a currency forward with the intention of purchasing it, spot or forward, at a later date in order to meet the forward contract; or the purchase of a currency forward with the object of selling it again (spot or forward). In the first case, given the forward rate, a speculative profit is made if the spot rate rises above the forward rate by the time the forward contract matures; in the second case, a profit is made if it falls below. Thus if a speculator sells pounds forward at \$2.80 = £1, to profit he must buy the pounds at less, say \$2.79 = £1; if he buys pounds forward he must sell at something more, say \$2.81 = £1, in order to profit.

Consider a speculator speculating on the expectation of a given devaluation in the spot pound: he buys dollars forward, expecting to get more pounds for his dollars when the contract matures than he paid for them; or if he sells pounds forward, expecting to obtain the pounds for fewer dollars than he receives for them. Both cases give rise to a supply of forward pounds. Given the spot rate and the expected devaluation, the lower the forward rate, the smaller the profit from a speculative sale of forward pounds in the event of a given devaluation; or the greater the loss if there is no devaluation. Hence the lower the forward rate, the smaller the supply of forward pounds for speculation.

Now consider speculation on the expectation that the pound will not be devalued. Then, given the spot rate, the lower the forward rate (below the spot rate lower limit), the greater the profit if the pound does not devalue and the less the loss from a given devaluation if it does. Hence the lower the forward rate, the greater the speculative demand for forward pounds.

By the same reasoning, it also follows, the higher the forward rate, the greater the supply of forward pounds and the smaller the demand. The net speculative supply of, or demand for, forward pounds is the surplus speculative supply or demand after speculative sales have been matched as far as possible by speculative purchases. If we start with a very high forward rate, given the spot rate, there will probably be a net speculative supply of forward pounds. As the forward rate falls the net speculative supply falls until a forward rate is reached at which there is no net speculative supply or demand. When the forward rate falls below this critical value a net speculative demand for forward pounds will appear, and the lower the forward rate, the greater it will become. The schedule relating the net speculative supply or demand for forward pounds (given the spot rate) to the forward rate I shall call the B'' schedule (see Fig. 1).

(2) *Interest Arbitrage.* The interest arbitrageur uses the forward market to obtain a safe profit. In order to take advantage of higher interest rates in another country, it is necessary to obtain that country's currency. The

gain from the higher interest rate is then liable to be offset, in part or completely, by the loss which results if the foreign currency is devalued. To cover against this possibility the arbitrageur sells forward the currency he purchases spot. He will be willing to do this so long as the cost of covering is less than the gain from the higher interest; or the profit from the forward purchase is greater than the loss of interest. It therefore follows that there will be an interest arbitrage supply of forward pounds if there is an intrinsic premium on the forward pound, and a demand for forward pounds when there is an intrinsic discount. The higher the intrinsic premium, the greater the supply of forward pounds; the higher the intrinsic discount, the greater the demand. The intrinsic premium measures the profit to be made from selling dollars spot and buying them forward, investing the

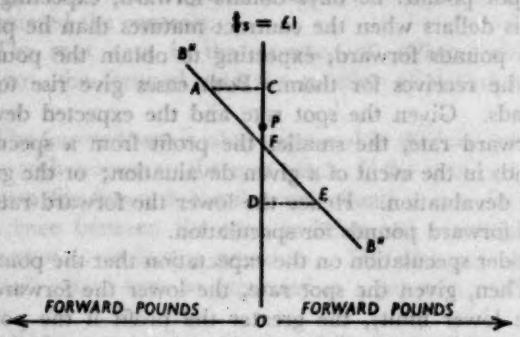


FIG. 1

P is the spot rate.
F the critical value of the forward rate.
B"B" is the net speculative schedule.
AC measures the net speculative supply of forward pounds at a forward rate of *C*, *i.e.*, a forward premium of *CP*.
DE measures the net speculative demand for forward pounds at a forward rate of *D*, or a forward discount of *DP*.

proceeds of the spot contract in Britain until the forward contract matures. We may call this "inward interest arbitrage." The intrinsic discount measures the profit from "outward interest arbitrage."

The supply of (or demand for) forward pounds does not change uniformly with changes in the intrinsic premium (or discount). It tends to rise slowly as the intrinsic premium (or discount) rises (arithmetically) from 0 to ½% p.a. This is because the more complicated transaction involved in interest arbitrage compared with home lending is considered hardly worthwhile for a return of less than ½% p.a. by most interest arbitrageurs. Once the intrinsic premium (or discount) reaches about ½% p.a., however, the supply of (or demand for) forward pounds increases rapidly, as nearly all

the funds available to the interest arbitrageurs are used. As the intrinsic premium (or discount) rises above ½% the supply of (or demand for) forward pounds becomes inelastic again. The profit from interest arbitrage may have to rise to 2–3% before the arbitrageurs can get hold of new funds or operators who do not normally deal in interest arbitrage start coming into the market. Given the spot rate and the interest parity value of the forward rate, a schedule may be drawn relating the interest arbitrage demand or supply of forward pounds to the forward rate. I call this schedule the *A'* schedule (see Fig. 2).

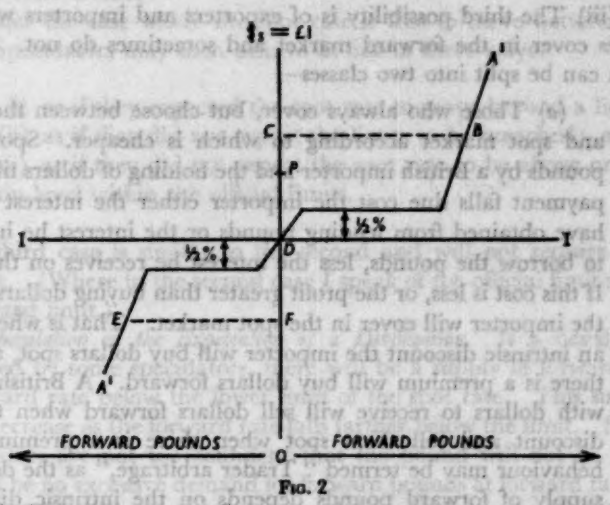


FIG. 2

P is the spot rate.
II cuts the *Y*-axis at a point *D* equal to the interest parity value of the forward rate [the United Kingdom interest rate is higher than that of the United States for *D* to *BE* below *P*].
A'A' is the Arbitrage Schedule.
EF is the arbitrage *supply* of forward pounds for a forward rate of *F* (an intrinsic discount of *DF*).
CB is the arbitrage *demand* for forward pounds at an intrinsic premium of *CD*.

(3) *Commercial Demand for Forward Exchange.* International trade gives rise to receipts and payments in foreign currencies. Traders who are to receive or make payment in a foreign currency may behave in three ways:

(i) They may always wait until the payment or receipt is due and then buy or sell spot. This will not have an immediate effect on the forward market.

(ii) They may always cover forward, buying forward the currency they have to pay, and selling forward the currency they are to receive. Their demand or supply of forward pounds will therefore depend on the level of their imports and exports and not on the spot or forward

rate. (Though the same factors may affect both.) At any given time there will be a net demand or supply of forward pounds for automatic cover. Though the amount will change from time to time, in a static analysis it may be included in the diagrammatic analysis of the demand for forward exchange by drawing a new schedule, called the *B'* schedule, which is the same as the *B''* schedule except that it is shifted to the right to the extent that, at a given instant, there is an excess demand for forward pounds for automatic cover. If there is an excess supply for automatic cover the *B'* schedule lies to the left of the *B''* schedule.

(iii) The third possibility is of exporters and importers who sometimes cover in the forward market and sometimes do not. These in turn can be split into two classes—

(*a*) Those who always cover, but choose between the forward and spot market according to which is cheaper. Spot sales of pounds by a British importer and the holding of dollars till a dollar payment falls due cost the importer either the interest he could have obtained from lending pounds or the interest he has to pay to borrow the pounds, less the interest he receives on the dollars. If this cost is less, or the profit greater than buying dollars forward, the importer will cover in the spot market. That is when there is an intrinsic discount the importer will buy dollars spot, and when there is a premium will buy dollars forward. A British exporter with dollars to receive will sell dollars forward when there is a discount and sell them spot when there is a premium. This behaviour may be termed "Trader arbitrage," as the demand or supply of forward pounds depends on the intrinsic discount or premium. The supply of trader arbitrage funds in the forward market will be included in the same schedule as the interest arbitrage funds; it is assumed that this does not change the shape of the schedule. This schedule is now called the *A* schedule.

(*b*) Traders who sometimes cover forward and at others don't cover at all will be influenced in their choice by the same factors as the speculators. Thus "Trader Speculation" is included in the speculative schedule to make the new schedule the *B* schedule. The *B* schedule will tend to be more elastic than the *B'* schedule.

(4) *Hedging.* An American holder of sterling assets may wish to cover against a fall in their dollar value resulting from a devaluation of the pound. If he only sometimes covers forward he may be regarded in the same way as the speculator. His actions may be included in the *B* schedule. If he sometimes covers forward and sometimes spot by borrowing pounds his choice again depends on the intrinsic discount or premium, and he also may

be included in the *A* schedule. The same analysis may be applied to the British holder of dollar securities.[1]

We have now split the demand for forward exchange into two schedules, the *A* schedule, loosely called the arbitrage schedule, influenced by the intrinsic discount and premium; and the *B* schedule, loosely called the speculative schedule, influenced by the forward rate and the expected spot rate. The forward rate at any given time is determined by the intersection of these two schedules.

It is possible, by making certain assumptions about the shape of the schedules, to produce some sort of explanation of the behaviour of the forward rate from 1951 to 1959.

Consider the case where the spot rate is free to move between certain limits. Speculators may then behave in one of three ways:

(i) as if they expected the spot rate to move beyond a limit;
(ii) as if they did not expect the limits to be breached; or
(iii) as if they did not expect the spot rate to be above or below a certain level within the official limits.

The third case is similar to the second and will not require separate treatment. (Where in the second case I speak of the official limit substitute the expected limit.)

(1) *Speculation on the Expectation of a Devaluation.* If a devaluation is anticipated by some speculators, there will be a supply of forward pounds at a forward rate below the lower limit of the spot rate. This supply will tend to decrease as the forward rate falls farther below the limit. Similarly, if speculators are not too confident that the pound will not be devalued there will be no excessive demand for forward pounds at forward rates below the limit. The demand will, however, rise as the forward rate falls. (The same, *mutatis mutandis*, can be said for expectation of a revaluation.) The *B* schedule in this case is drawn as in Fig. 3 (B_0B_0). P_0 is the spot rate, *U* its upper limit and *L* its lower, B_0B_0 is the speculative schedule. The "net speculative" demand for forward pounds increases with a fall in the forward rate below *L*, and the supply for a rise above U.

Assume that a fall in the spot rate gives rise to increased expectations of a further fall, then the *BB* schedule will shift to the left. In doing so an intrinsic discount will tend to be produced. This discount widens as the spot rate falls and narrows as it rises (Fig. 3).

With different assumptions we get the opposite result.

(2) *Speculation in Conditions of Confidence in the Limits.* If there is no expectation of a spot rate fall below the lower limit there will be no speculative

[1] For the Analysis so far I am in the debt of Mr. A. E. Jasay, who presented the framework in his article "Bank Rate or Forward Exchange Policy" (*Banca Nazionale del Lavoro Quarterly Review*, No. 44, March 1958).

supply of forward pounds at forward rates below that limit. There will, however, be a large speculative demand at forward rates below the lower limit. Hence the speculative schedule becomes elastic to falls in the forward

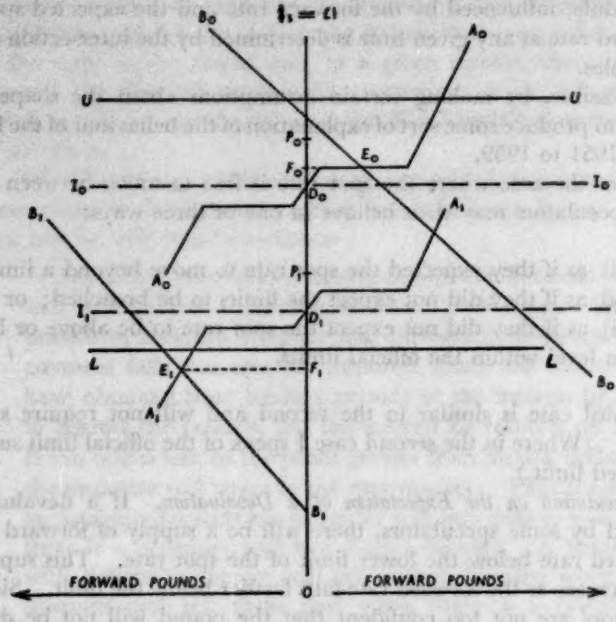


FIG. 3

P_0 is the initial spot rate.
I_0I_0 cuts the Y-axis at D_0, the initial interest parity.
UU cuts the Y-axis at the upper limit.
LL cuts the Y-axis at the lower limit.
A_0A_0 is the Arbitrage Schedule corresponding to D_0.
B_0B_0 is the "Net Speculative" Schedule corresponding to P_0.
A_0A_0 cuts B_0B_0 at a forward rate F_0 (an intrinsic premium F_0D_0), where the net speculative demand F_0E_0 equals the arbitrage supply F_0E_0.
P_1 is the new spot rate.
D_1 is the new interest parity (interest rates unchanged $P_0D_0 = P_1D_1$).
A_1A_1 is the Arbitrage Schedule corresponding to D_1.
B_1B_1 is the new "Net Speculative" Schedule. The shift from B_0B_0 being due to the fall in the spot rate.
F_1 is the new forward rate given by the intersection A_1A with B_1B.
F_1 gives an intrinsic discount of D_1F_1.

rate approaching and passing the lower limit. Similarly, the speculative supply of forward pounds becomes elastic for forward rates approaching and above a level beyond which the spot rate is not expected to rise (normally the upper limit). This type of speculative schedule is shown in Fig. 4 (BB).

Now assume that:

(*a*) a movement in the spot rate does not lead to a shift in the net speculative schedule because it gives rise to expectations of a subsequent movement in the opposite direction;

(*b*) that the *B* schedule becomes completely elastic at a point closer to the vertical axis than the point at which the *A* schedule becomes inelastic.

Then if the interest parity dictates a forward rate below the rate at which the demand for forward pounds becomes elastic an intrinsic premium is

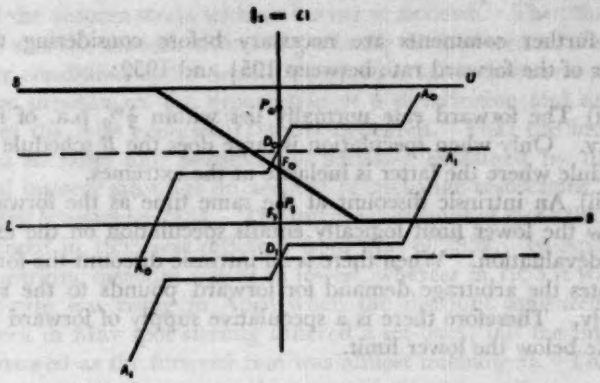


FIG. 4

P_0 is the initial spot rate.
BB is the " Net Speculative " Schedule.
A_0A_0 is the initial Arbitrage Schedule corresponding to D_0.
F_0 is the initial forward rate given by the intersection of A_0A_0 with BB corresponding to an *intrinsic discount* of F_0D_0.
D_1 is the new interest parity resulting from either a fall in the spot rate to P_1 ($P_0D_0 = P_1D_1$) or a change in the interest rates (P_0D_0 to P_0D_1).
A_1A_1 is the new Arbitrage Schedule corresponding to D_1.
F_1 is the new forward rate given by the intersection of A_1A_1 with BB. It represents an *intrinsic premium* of F_1D_1.

produced, and if it dictates a forward rate above the level at which the supply becomes elastic a premium is produced. This situation can result from a movement in the interest parity value of the forward rate caused by either a shift in the spot rate, a change in the interest rates or both.

It follows that an intrinsic premium may be produced by a spot-rate fall or a widening of the interest differential, and may be removed by a rise in the spot rate and a narrowing of the excess of the British interest rate over the American. Similarly, an intrinsic discount may be produced by a rise

in the spot rate and a narrowing of the interest differential and be removed by a spot-rate fall or a widening of the differential (see Fig. 4).

Thus we have two possible types of intrinsic discount or premium:

(i) An intrinsic premium associated with a spot-rate rise and a discount with a fall (see p. 309, section (1)). The premium tends to disappear with a spot-rate fall and the discount with a rise. I shall call these " doubt " intrinsic premiums and discounts.

(ii) An intrinsic premium associated with a fall in the spot rate and a discount with a rise (see p. 309, section (2)). The premium tends to disappear with a spot-rate rise and the discount with a fall. I call these " confidence " premiums and discounts.

Two further comments are necessary before considering the actual behaviour of the forward rate between 1951 and 1959:

(i) The forward rate normally lies within ½% p.a. of its interest parity. Only when speculation is large does the *B* schedule cut the *A* schedule where the latter is inelastic at the extremes.

(ii) An intrinsic discount at the same time as the forward rate is below the lower limit logically entails speculation on the expectation of a devaluation. When there is an intrinsic discount the forward rate equates the arbitrage demand for forward pounds to the speculative supply. Therefore there is a speculative supply of forward pounds at a rate below the lower limit.

Three charts show the behaviour of the forward rate between 1951 and 1959:

Chart 1 shows the spot rate and the three-month-forward rate.

Chart 2 shows the forward discount or premium and its interest parity (I have taken the three-months treasury-bill parity).

Chart 3 shows the difference between the forward rate and its interest parity, the intrinsic discount or premium. Where the discount or premium is greater than ½% p.a. the graph is shaded.[1]

There were four periods when there was an appreciable (greater than ½%) intrinsic discount on the forward pound.

(1) *December 1951 to December 1952.* Following the re-opening of the foreign-exchange markets in mid-December 1951 the spot pound fell to its lower limit, and a substantial discount appeared on the forward pound. This meant that the forward rate was below the lower spot rate limit. In addition, there was a sizeable intrinsic discount. This in itself is evidence of speculation on the expectation of a devaluation. Nor is it surprising that

[1] See Appendix.

there was such speculation. Space permits mention of but few factors leading to speculation against sterling. The terms of trade had moved against the sterling area, the balance of payments was adverse, excess home demand was impeding exports and encouraging imports. In consequence, the reserves fell when the pound should have been seasonally strong.

As the spot rate fell in December, the intrinsic discount increased. It decreased again in March with the rise in the spot rate due to the Bank Rate rise and the Budget. However, the decline in the reserves at the beginning of 1952 gave rise to doubts concerning the ability of sterling to withstand the seasonal strain. As a result, renewed speculation cut short the spot-rate recovery and produced a wide intrinsic discount once more. The intrinsic discount remained substantial until it became clear that the pound had withstood the autumn strain without having to devalue. Then the spot rate recovered and the intrinsic discount gradually disappeared. Thus in 1952 there were conditions under which it seemed evident there was substantial speculative pressure on the expectation of a devaluation and an intrinsic discount of the type expected (Doubt) appeared. That the intrinsic discount was so large and persistent is partially explained by the lack of substantial interest arbitrage on account of exchange restrictions.

(2) *April to September 1953.* The intrinsic discount of more than ¼% p.a. that appeared in 1953 was different from that of 1952. In April to June 1952 the intrinsic discount was at its lowest, whereas in 1953 it was highest. The spot rate was rising in April when the discount appeared. In the second week in May spot sterling suffered a set-back, but the intrinsic discount narrowed as the forward rate was almost unchanged. The intrinsic discount reacted to changes in the spot rate in this manner until it disappeared with the fall in the spot rate in September. This intrinsic discount was a " Confidence " discount. In view of the strength of the spot rate, it was unlikely that there was much speculation on a devaluation, but still the interest parity dictated a forward rate above the level the spot rate was expected to be in three months time. Three months from April to July is July to October, the period of seasonal weakness. The forward rate required was about \$2.81¼ in April to July, a very high level for the spot rate in autumn. Hence the intrinsic discount as the forward rate refused to rise to this level. The fall in the spot rate lowered the interest-parity value of the forward rate until the forward rate could approximate to it.

(3) *November 1956 to January 1957.* In July 1956, following the nationalisation of the Suez Canal, the spot rate fell to \$2.78¼, the forward rate fell below \$2.78, but the forward discount on the pound did not appreciably widen. As a result, the forward rate stayed close to its interest parity and no appreciable intrinsic discount appeared. This is probably accounted for by the fact that since 1952 the volume of interest arbitrage had increased with relaxation of exchange restrictions. The Anglo-French intervention in Suez and the closing of the canal increased speculation, and the forward

discount rose to about 4%, while the intrinsic discount rose to about 2%. There was some improvement in the forward rate on December 11 and 12, when the measures taken by the British authorities to defend sterling became known, and the IM.F. granted assistance. But it was not until January 1957, with the publication of the reasonable December reserves figures and the feeling that sterling had got over the worst, that the intrinsic discount disappeared. It disappeared with the rise in the spot rate. Enough has been said to support the statement that the 1956 intrinsic discount was due to speculation on the expectation of a devaluation. The intrinsic discount behaved as a " doubt " discount.

(4) *May to October 1957.* The 1957 crisis is familiar to most people. For my purposes all that need be said is that the intrinsic discount did tend to widen with the fall in the spot rate and narrow with the rise. The rise in the Bank Rate, together with the firm statement that the pound would not be devalued or the mark revalued, led to a rise in the spot rate and a narrowing of the forward discount to meet the wider interest parity. As a result the intrinsic discount was gradually removed. The 1957 crisis illustrates just how far the forward rate may have to fall before the speculative supply of forward pounds has been reduced sufficiently to match the limited arbitrage demand. The forward discount actually rose to 6% and the intrinsic discount to 5·4%.

During the period an intrinsic premium greater than ½% appeared on three occasions.

(1) *January to February 1954.* This intrinsic premium was probably due to some expectations of revaluation or convertibility with a free pound. It appeared when the pound was strong and rising and disappeared when the pound fell.

(2) *May 1954 to April 1955.* The premium that appeared in May was probably due to the interest parity dictating a forward rate as low as \$2.80⅞ at a time when the spot rate stood at \$2.81¾ and when there was great confidence in sterling. In 1953 the spot rate had been around \$2.81¾ from May to July, and had only fallen to \$2.80 in the last three weeks of September and the first week of October. Compared with the previous year, the reserves were higher, the trade position appeared favourable and the pound had not been under serious pressure for two years. So it may have been anticipated that the spot rate would not fall too low or remain depressed for long in the autumn. Hence until the spot rate fell in August the forward rate refused to fall below \$2.81⅛. The fall in the spot rate was regarded as only temporary, so that the lower it fell, the greater was the expectation of a rise. The forward discount narrowed and finally disappeared, and as a result the intrinsic premium grew. The fall in the spot rate and its failure to recover in late 1954 were thought to be due to the dock strike and delayed seasonal pressure on account of leads and lags in sterling's favour. Hence the

expectation of a rise and the large intrinsic premium. In fact, the dock strike masked a deterioration in the sterling area's external position. The intrinsic premium disappeared with the recovery of the spot rate in 1955 and the realisation of the true position.

(3) *January to June 1958.* After the 1957 crisis the British Bank Rate remained at 7% for some time, while foreign rates declined. The interest parity widened. Thus, although the spot pound was strong again, the interest parity value of the forward rate was still below $2.78. The forward rate could not fall to this level, and so an intrinsic premium was produced. In March and April the interest parity narrowed but the forward discount remained unchanged; thus the intrinsic premium was temporarily removed. It reappeared in May, when the interest parity widened again and the forward discount narrowed. The gap was closed with the fall in the excess of the British interest rates over the American.

There is, of course, a complete neglect in this analysis of periods in which the forward rate was close to its interest parity. If space were available it would be necessary to consider these periods and to show that the non-existence of a substantial intrinsic discount or premium did not conflict with what we might expect from theory. However, the aim of this paper has been to show that by making certain not too unrealistic assumptions it is possible to give some sort of explanation of the forward-rate movements. It has not been intended to prove that those assumptions are correct. The problem this analysis produces is therefore that of testing whether speculation has in fact been of the type suggested at the different times. This could possibly be done by using some independent index of confidence, but unfortunately such an index would be by no means easy to obtain.[1]

B. READING

Nuffield College,
Oxford.

[1] For charts of rates see pp. 316–319.

APPENDIX

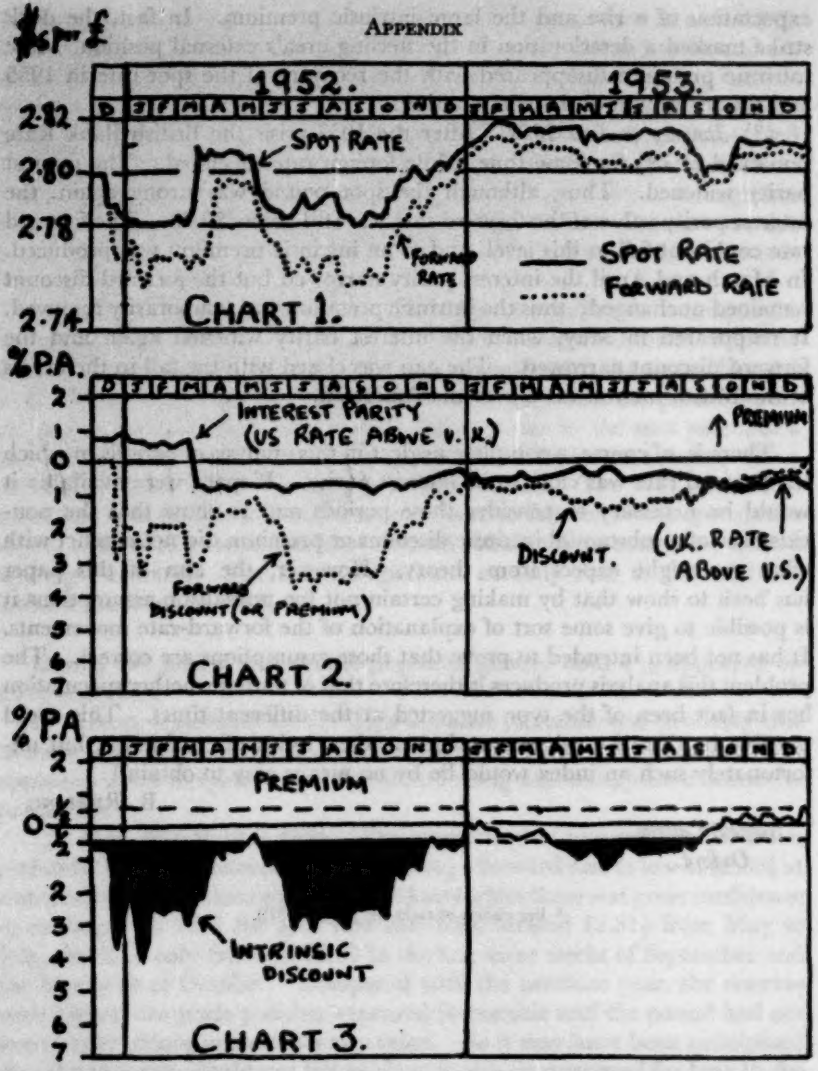
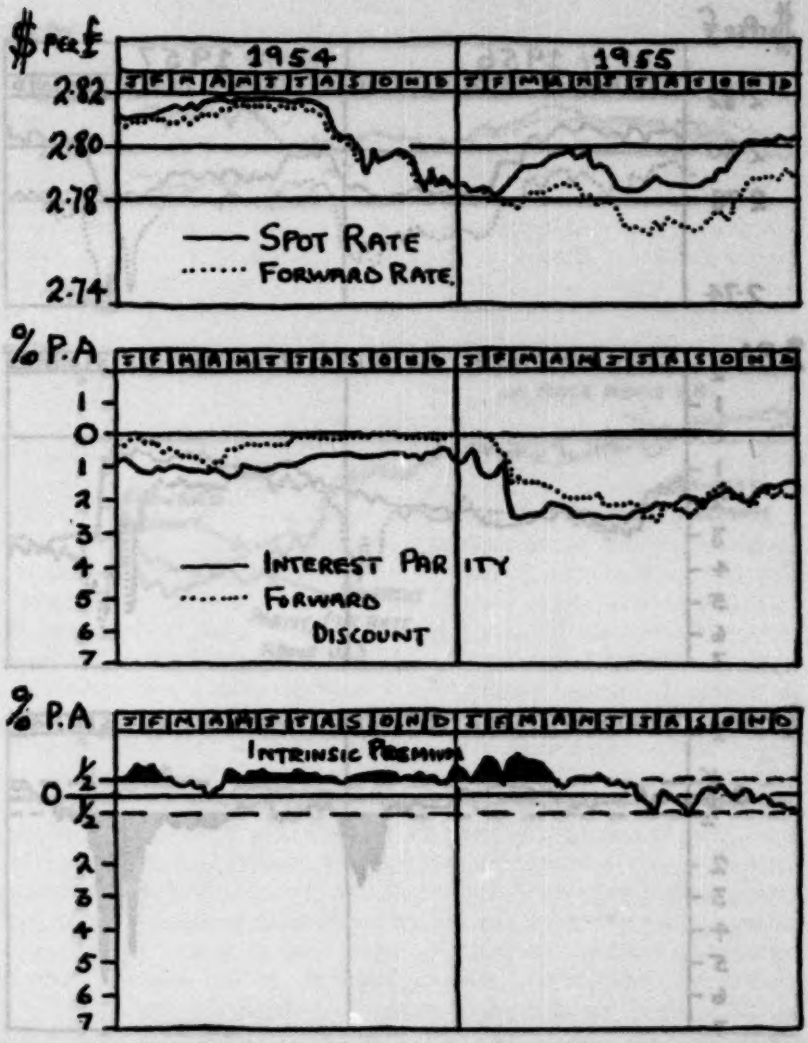


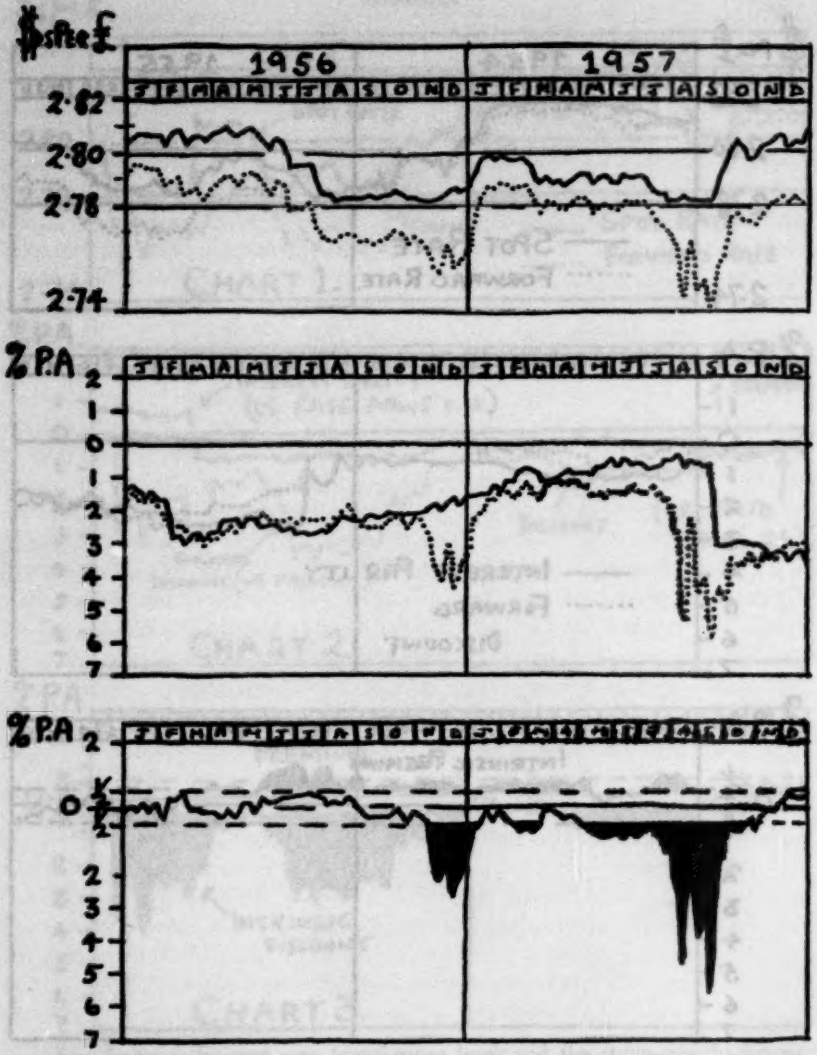
Chart 1 shows the spot rate (continuous line) and the three-months-forward rate (dotted line) between the pound and the dollar in terms of the number of dollars exchanged for one pound. They are both plotted weekly using figures for Wednesdays. The spot rate is the average value of the days spread, obtained from Samuel Montagu's *Review of Foreign Exchanges*. The forward rate is calculated by subtracting the forward discount or adding the forward premium to the spot rate. The forward discount or premium is obtained from the same source; the average of the closing rates is taken.

Chart 2 shows the forward discount or premium as a per cent per annum of



the spot rate (dotted line). Premiums are plotted as positive, discounts negative. The interest parity (continuous line) is the difference between the weekly average tender rates of allotment on British and American three-months treasury bills. These are obtained from the Bank of Canada *Statistical Summary*. The interest parity is plotted as negative when the British rate is higher than the American.

Chart 3 shows the intrinsic discount or premium, that is the difference between the two lines in Chart 2. A premium, where the forward rate is above its interest parity, is plotted as positive. Horizontal lines are drawn at 0, and $\pm\frac{1}{2}\%$ p.a. Where the intrinsic discount or premium exceeds $\frac{1}{2}\%$ p.a. the graph is shaded


$ sfte £
1956
1957
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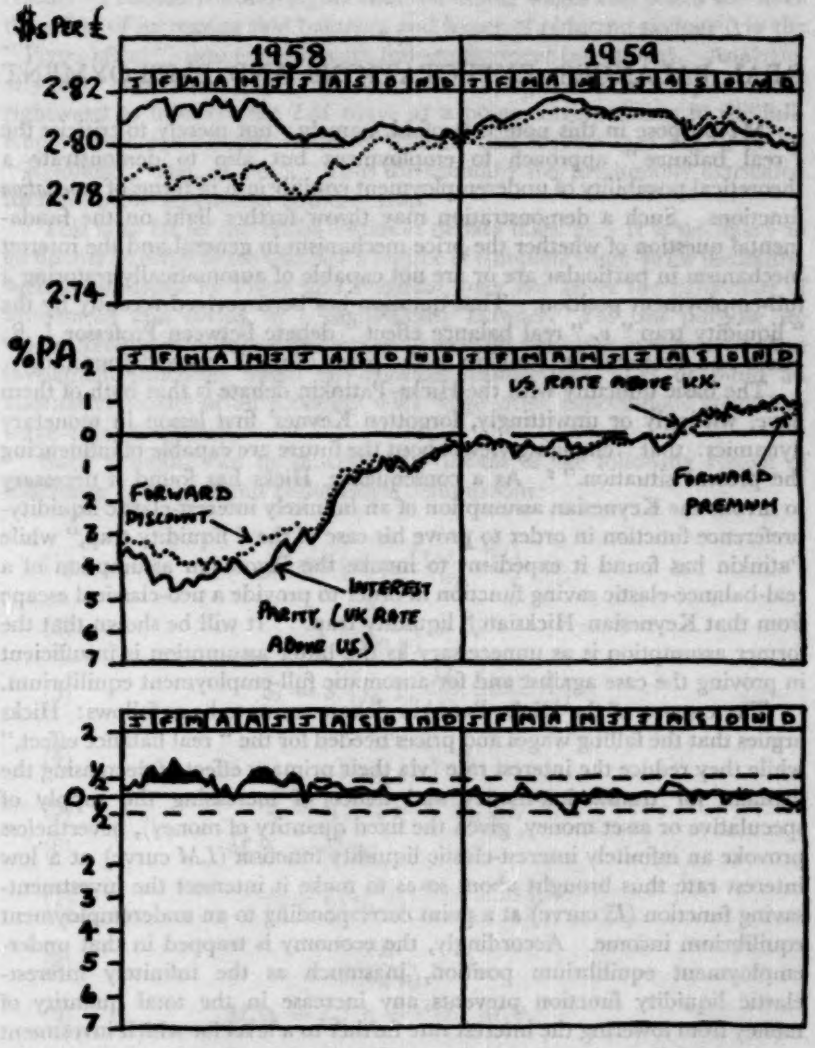
7


$'s PER £
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2·80
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1
2
3
4
5
6
7
U.S. RATE ABOVE U.K.
FORWARD PREMIUM
FORWARD DISCOUNT
INTEREST PARITY (U.K. RATE ABOVE U.S.)
2
½
0
½
2
3
4
5
6
7

REAL BALANCES, EXPECTATIONS AND EMPLOYMENT

My purpose in this note is twofold, namely: not merely to criticise the "real balance" approach to employment but also to demonstrate a theoretical possibility of underemployment equilibrium in terms of *expectation* functions. Such a demonstration may throw further light on the fundamental question of whether the price mechanism in general and the interest mechanism in particular are or are not capable of automatically restoring a full-employment position. That question has been revived recently by the "liquidity trap" *v.* "real balance effect" debate between Professor J. R. Hicks and Professor D. Patinkin in the pages of the ECONOMIC JOURNAL.[1]

The basic difficulty with the Hicks–Patinkin debate is that both of them have, wittingly or unwittingly, forgotten Keynes' first lesson in monetary dynamics: that "changing views about the future are capable of influencing the present situation."[2] As a consequence, Hicks has found it necessary to invoke the Keynesian assumption of an infinitely interest-elastic liquidity-preference function in order to prove his case of the "liquidity trap," while Patinkin has found it expedient to invoke the Pigouvian assumption of a real-balance-elastic saving function in order to provide a neo-classical escape from that Keynesian–Hicksian "liquidity trap." It will be shown that the former assumption is as unnecessary as the latter assumption is insufficient in proving the case against and for automatic full-employment equilibrium.

The essence of the Hicks–Patinkin debate seems to be as follows: Hicks argues that the falling wages and prices needed for the "real balance effect," while they reduce the interest rate (via their primary effect of decreasing the demand for transaction-money and hence of increasing the supply of speculative or asset money, given the fixed quantity of money), nevertheless provoke an infinitely interest-elastic liquidity function (*LM* curve) at a low interest rate thus brought about so as to make it intersect the investment-saving function (*IS* curve) at a point corresponding to an underemployment equilibrium income. Accordingly, the economy is trapped in that underemployment equilibrium position, inasmuch as the infinitely interest-elastic liquidity function prevents any increase in the total quantity of money from lowering the interest rate further to a level for which investment can equal full-employment savings. This is where Patinkin comes to the

[1] See J. R. Hicks, "A Rehabilitation of 'Classical' Economics?" ECONOMIC JOURNAL, June 1957, and D. Patinkin, "Keynesian Economics Rehabilitated: A Rejoinder to Professor Hicks," *ibid.*, September 1959. Their debate is the continuation of the so-called liquidity trap controversy started by Keynes "The Psychological and Business Incentives to Liquidity" (Chapter 15) in the *General Theory*. The controversy was renewed by D. Patinkin, *Money, Interest and Prices* (1956), especially Chapters 13 and 14.

[2] *General Theory*, p. 293.

rescue. Patinkin counter-argues that the falling wages and prices *also* have the effect of increasing real balances and hence of reducing savings (via the "Pigou effect") into equality with full-employment investment. Analytically this "real balance effect" is shown as shifting the *IS* curve upward and rightward to intersect the *LM* curve at a point corresponding to the full-employment equilibrium values of interest and income (see Fig. 2 in his "Rejoinder," *ibid.*, p. 585). Thus the economy has presumably extricated itself from the Keynesian liquidity trap.

This is as far as the Hicks–Patinkin debate takes us. It is necessary to go further in order to see whether a regime of complete wage–price flexibility, such as envisaged by Pigou and Patinkin, may not affect the behaviour of investment and saving in a destabilising manner. For this purpose we would have to introduce expectations as explicit variables in the saving and investment functions based on dynamic assumptions. Let us build an alternative model of an economy with wage–price expectations as well as wage–price flexibility.

Such a model can be described by means of the following system of difference equations and behavioural assumptions:

$$I_t = I\left(r_t, y_t, \frac{w_{t+1} - w_t}{w_t}\right), \tag{1}$$

$$\frac{\partial I}{\partial(\log w)} > 0, \tag{2}$$

$$S_t = S\left(r_t, Y_t, \frac{M_t}{p_t}, \frac{p_{t+1} - p_t}{p_t}\right), \tag{3}$$

$$\frac{\partial S}{\partial(\log p)} < 0, \tag{4}$$

$$I_t = S_t;\ Y_t = Y^\circ(I_t, S_t), \tag{5}$$

$$M_t/p_t = \bar{M}/p_t, \tag{6}$$

$$L_t = L\left(r_t, Y_t, \frac{w_{t+1} - w_t}{w_t}\right), \tag{7}$$

$$\frac{\partial L}{\partial(\log w)} < 0, \tag{8}$$

$$M_t/p_t = L_t;\ r_t = r^\circ(L_t, M_t/p_t) \tag{9}$$

Here the subscripts t and $t+1$ denote the variables in terms of the present period and the next period; I and S stand for real investment and real savings; M/p and L are the amounts of real balances supplied and demanded, $\bar{M}$ being the fixed quantity of nominal balances held by the public; Y° and r° are respectively the equilibrium values of real income (Y) and the interest rate (r); $\log w$ and $\log p$ represent percentage changes in the money wage-rate and the price index. Here we suppress the labour market equation on

the simplifying assumption that employment is a linear function of income, so that the " full-equilibrium " position of our general system consists in the simultaneous solution of equations (5) and (9) for r and Y, with the other independent variables serving as shift parameters. The key variables of this system are the *expected* percentage changes in the money wage-rate and the price index, $(w_{t+1} - w_t)/w_t$, $(p_{t+1} - p_t)/p_t$, in equations (1), (3) and (7) corresponding to the crucial assumptions expressed by (2), (4) and (8).

Equation (1) gives current investment as a function of an expected percentage change in the money wage-rate as well as of current interest and income, while (2) specifies investment as an *increasing* function of a percentage change in the money wage-rate. This latter functional shape is based on the assumption that private investment would be profitably withheld in anticipation of lower and lower labour cost, and vice versa. In the present context of unlimited wage falls this means that investment will decrease with wages over time, the amount of that decrease depending on the prevailing elasticity of wage expectations. Equation (3) gives current savings as a function of an expected percentage change in the price index as well as of current interest, income and real balances (a decreasing function of real balances via the " Pigou effect " assumed), while (4) specifies savings as a *decreasing* function of a percentage change in the price index. This last relation, in the present context of complete downward price flexibility, means that the consuming public would withhold current consumption expenditure in anticipation of lower and lower prices and so increase current savings, the amount of that withholding depending on the prevailing elasticity of price expectations.

Equation (5) states the condition for equilibrium in the *commodity* market and the implied dynamic determination of equilibrium income. Equation (6) gives the supply of real balances as a function of a constant stock of money and current prices, while equation (7) gives the demand for real balances as a function of an expected percentage change in the money wage-rate as well as of interest and income. (8) specifies the demand for money in real terms as a *decreasing* function of a percentage change in the money wage-rate, implying that in the present context of complete downward wage flexibility the public's demand for real balances would rise in anticipation of further wage falls and greater uncertainties that accompany those wage falls. Equation (9) states the condition for equilibrium in the *money* market and the implied dynamic determination of the equilibrium rate of interest.

Simultaneous solution of equations (5) and (9) for r and Y represents one of an underemployment equilibrium characterised by

$$(10)\quad \begin{cases} I_t = S_t;\ Y^o(I_t, S_t) < Y_f, \text{ where } Y_f \text{ is full-employment real income} \\ M_t/p_t = L_t;\ r^o(L_t, M_t/p_t) > r_f, \text{ where } r_f \text{ is full-employment interest} \end{cases}$$

This position of underemployment equilibrium expressed by (10) can be further clarified by reference to Fig. 1.

In Fig. 1 the slope of the *IS* curve is larger than that of the *LM* curve so as to assure stable equilibrium, whether with or without full employment (on the tacit assumption that the marginal propensity to save exceeds the marginal propensity to invest, which may be zero or small). The solid *IS* curve may be thought of as having shifted leftward to its present position through the influence of wage–price expectations, and the solid *LM* curve may be thought of as having shifted also leftward to its present position through the influence of wage expectations—according to our specific assumptions. The leftward shift of the *IS* curve implies that the increasing effect of price expectations on savings necessitates a lower rate of interest to

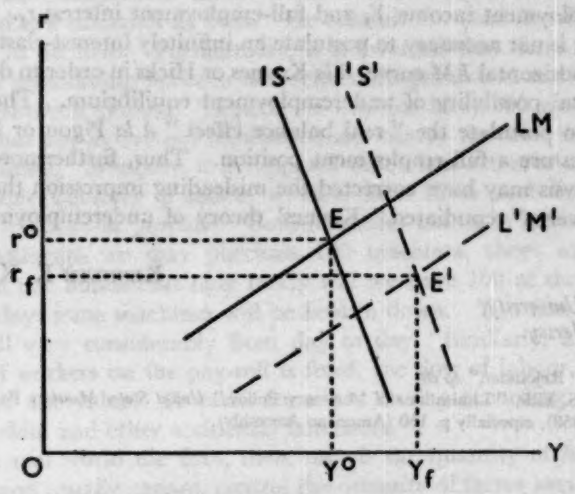

FIG. 1

discourage savings and to stimulate investment into equality with each other at any level of real income. On the other hand, the leftward shift of the *LM* curve implies that the increasing effect of wage expectations on liquidity-preference necessitates a higher rate of interest to reduce the demand for real balances into equality with the supply of real balances at any level of real income. The *LM* curve is assumed to shift leftward by an amount larger than the amount by which the *IS* curve shifts leftward, that is, on the plausible ground that the influence of wage expectations on liquidity-preference in a regime of indefinitely falling wages and consequently increasing uncertainties is greater than that of wage–price expectations on the propensities to invest and to save (money is hard to come by in such a regime).

The *IS* and *LM* curves, as such, are seen intersecting at equilibrium point *E*, corresponding to the equilibrium values of r and Y (that is, r° and

Y^0), but those equilibrium values of interest and income are respectively larger than full-employment interest r_f and smaller than full-employment income Y_f. There is no automatic mechanism to restore a full-employment position here, no matter how flexible wages and prices may be. For the interest rate cannot fall as a result of falling wages and prices to the required full-employment level, so long as the *LM* curve keeps on shifting leftward under the influence of wage expectations by an amount equal to or larger than the amount of leftward shift of the *IS* curve under the influence of wage–price expectations. *In the absence of* these expectations the *IS* and *LM* curves would shift to the hypothetical positions of *I'S'* and *L'M'*, as Patinkin describes.[1] In that case those curves would intersect at *E'* corresponding to full-employment income Y_f and full-employment interest r_f.

Thus it is not necessary to postulate an infinitely interest-elastic liquidity function (horizontal *LM* curve) *à la* Keynes or Hicks in order to demonstrate a theoretical possibility of underemployment equilibrium. Thus it is not sufficient to postulate the "real balance effect" *à la* Pigou or Patinkin in order to restore a full-employment position. Thus, furthermore, the foregoing analysis may have corrected the misleading impression that Patinkin has effectively "repudiated" Keynes' theory of underemployment equilibrium.[2]

KENNETH K. KURIHARA

Rutgers University,
New Jersey.

[1] See his "Rejoinder," *op cit.*

[2] See H. S. Ellis, "Limitations of Monetary Policy," *United States Monetary Policy* (Columbia University, 1958), especially p. 150 (American Assembly).

MARGINAL PRODUCTIVITY AND PROBABILITY DISTRIBUTIONS OF FACTOR SERVICES[1]

I

IN the theory of the firm the business-man, confronted with given technological conditions, buys factors of production and converts them into output. It is assumed that there are given prices of factors of production and that the entrepreneur makes decisions about the amounts of labour, capital and raw materials he buys. He controls the quantity of each factor employed in his firm. Furthermore, it is assumed that there is a unique one-to-one relationship between the factor units purchased and those fed in to the production system. Thus, if we buy (or hire) 100 machines, it is assumed that day-in day-out we shall obtain exactly the same services from those machines. Similarly, it is supposed that when 100 men are hired we get the same quantity of labour services from them each day. This is obviously not true in practice. Both machines and men have their "off-days." Although we may purchase 100 machines, there will be some thought in our minds that only rarely will we have 100 of them running. On most days some machines will be broken down. The flow of machine *services* will vary considerably from day to day. Similarly, although the number of workers on the pay-roll is fixed, the flow of labour *services* does not stay at one value. It varies from day to day according to weather, sickness, whim and other accidental influences.

In the real world the firm, then, *controls* the quantity of *factors*, but it does not, and usually cannot, control the quantity of factor *services*.[2] These behave essentially like a random variable. And we may reasonably assume that the entrepreneur has been in the business long enough to enable him to get a good idea of the extent and character of this variation. To formalise this, we can suppose that he knows exactly the joint probability distribution of the services he will get from given factor purchases.

The important question is what difference does this make to the theory of the firm? In particular, does this give us the same results concerning the employment of factors and marginal productivity curves as the ordinary theory—except that we now have to work in terms of "averages of factor services"? It is tempting to suppose that one need only substitute average labour services, average capital services, etc., in the isoquant and marginal-productivity diagrams and then carry on as before. In the next section

[1] I am grateful to Mr. Meyer Burstein for useful discussion.

[2] The firm can sometimes control the quantity of factor services to some extent but this always involves additional costs, *e.g.*, providing air-conditioning, hiring more repairmen for the machines. See, for example, W. Feller, *An Introduction to Probability Theory and its Application*, 2nd ed. (Wiley, 1957), pp. 416 *et. seq.*

we shall show that such a procedure would give incorrect results. In fact, the usual effect of variability in factor services is to increase the importance of the factor substitution effect. The marginal expected productivity curve is less erratic than is the ordinary marginal productivity curve.

II

Consider a firm producing holes in the ground and buying only two factors, labourers and spades. Let us suppose that one man must be combined with one spade to produce one hole, and that the production function

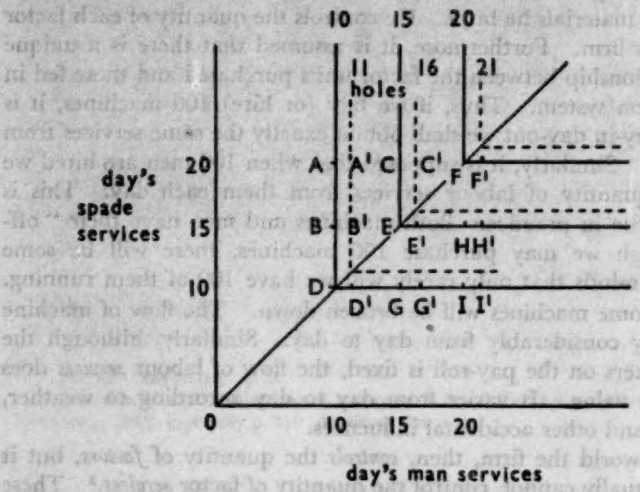

FIG. 1

is a homogeneous one. There are, however, rigid proportions, so that, for example, ten spades and one man still produce only one hole a day. The production function is illustrated in Fig. 1.

The entrepreneur can hire any number of men he likes, but the services they produce is a random variable. If he hires 15 men, we can suppose that *on the average* he gets 15 man services. The probability of him getting exactly 15 man services on a particular day is, however, only one-third, and it is equally likely that he get 10 or 20 man services instead (*i.e.*, prob (20) = prob (10) = prob (15) = $\frac{1}{3}$). Similarly, when he buys 15 spades the probabilities of 10, 15 and 20 spade services are also assumed to be equal at one-third.[1] We further assume, for convenience, that the "off days" of labourers are not associated with the "break-down" days of the

[1] We have assumed conventionally that the average of the probability distribution of a service is equal to the number of units of a factor hired.

spades. That is, we assume that the probability of a spade being broken is not changed by the fact that there are less labour services available.[1] The probability of producing at the points *A*, *B*, *C*, *D*, *E*, *F*, *G*, *H* and *I* is then $\frac{1}{9}$ each. The expected output is, however, not 15 holes, but:

$$(\tfrac{2}{9} \times 10) + (\tfrac{3}{9} \times 15) + (\tfrac{1}{9} \times 20) = 12\tfrac{7}{9} \text{ holes}$$

The chance variation in factor services forces the entrepreneur to accept inefficient proportions, so expected output is less than it would be if these chance variations were eliminated.

Consider a small increase in the quantity of labour purchased (say one man), while the number of spades remains constant. The effect will be to

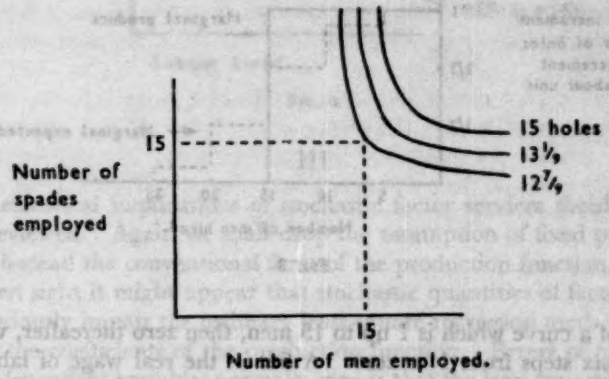

FIG. 2

move *A*, *B*, *C*, etc. to the primed points *A'*, *B'*, *C'*, etc. We suppose that the distance *AA'* is equal to the distance *BB'* and to *CC'*, etc.; and these are all equal to one man. The distribution has simply been moved along the horizontal axis by one unit.[2] If we now calculate expected output, we get:

$$(\tfrac{2}{9} \times 11) + (\tfrac{1}{9} \times 16) + (\tfrac{3}{9} \times 15) + (\tfrac{2}{9} \times 10) + (\tfrac{1}{9} \times 20) = 13\tfrac{1}{9} \text{ holes}$$

Thus, the effect of the entrepreneur hiring an extra man is to increase expected output by $13\frac{1}{9} - 12\frac{7}{9} = \frac{1}{9}$ hole. This might be called the marginal expected productivity of labour.

We can construct the equal-expected-product curves and the marginal expected productivity curves corresponding to the analogous concepts in the ordinary theory of the firm. The iso-expected quantity curves are shown in Fig. 2. On the axes we show the number of spades and men "on the pay-roll," which, by convention, we have assumed equal to the *average*

[1] Formally, this amounts to assuming statistical independence.

[2] Formally, this assumption means that the joint probability distribution is changed only with respect to one of its means.

supply of the corresponding service. The iso-expected quantity curves are not rectangular. They consist of small flat segments, beginning with a vertical and ending with a horizontal segment. These are just like the isoquants of a firm that has some elasticity of substitution within a certain range of factor proportions. The introduction of stochastic elements into factor supply converts fixed factor proportions into the more conventional case when a change in relative factor prices will cause a change in factor proportions.

In Fig. 3 we have drawn the marginal productivity curve of labour for a given quantity of spades (15) purchased.

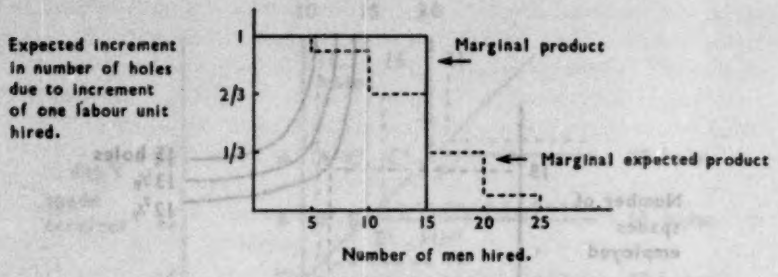

FIG. 3

Instead of a curve which is 1 up to 15 men, then zero thereafter, we have a series of six steps from 1 to zero. A fall in the real wage of labour from 0·9 holes to 0·8 holes will induce an expansion in labour purchases from 5 to 10 men—provided that we cannot change our purchases of spades. There is, or course, still some rigidity in the marginal expected productivity. A fall in real wages from 0·8 to 0·7 holes has no effect on factor proportions. But this is simply a consequence of having a discrete probability distribution. In fact, the distribution of labour services and spade services would approximate to a continuous distribution which falls off to zero at extreme values. Then it is intuitively obvious that, as one moves the continuous distribution along the horizontal of Fig. 2, the decline in the marginal expected product is gradual. The marginal expected productivity curve (with 15 spades) is then shown as MEP ($s = 15$) in Fig. 4. The demand curve for labour of the firm will cut across the marginal expected productivity curves as shown. These curves again are the same as those that appear when there is some substitutibility between factors. But these are *expected* relationships and were derived from a case in which, technologically, proportions were fixed.

If we now drop the assumption of fixed proportions, the above analysis can be applied to isoquants which have the ordinary smooth convex pattern. The general effect of stochastic supplies of factor services is to give rise to

lower and usually flatter iso-expected quantity curves. If the original isoquants had little curvature the ratios of marginal productivities will be almost the same as the ratios of marginal expected productivities.

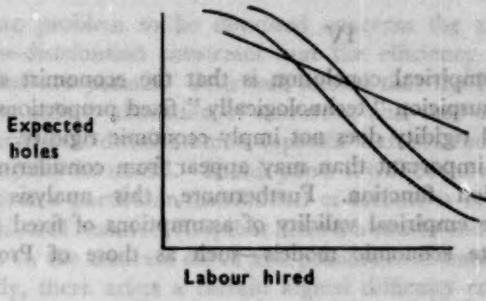

FIG. 4

III

The statistical implications of stochastic factor services should now be briefly reviewed. Again we shall drop the assumption of fixed proportions and use instead the conventional form of the production function.

At first sight it might appear that stochastic quantities of factor services would seriously impair the ordinary least-square regression methods used to estimate the coefficients of the production function. Errors of observation in the independent variables normally means that the least squares estimates are biassed. Consider, for example, the Cobb–Douglas production function $X = AL^{\alpha}K^{\beta}$, where X is output, L is quantity of labour and K is quantity of capital. Our model suggests that the entrepreneur buys L units of labour but feeds into the production process Lv units of labour service, where v is a random variable, and buys K units of capital but feeds in Ku units of labour service, where u is a random variable. And to complete the statistical model we might suppose there are other random influences on output which may be denoted by the multiplicative random variable ϵ.

Thus: $$X = A(Lv)^{\alpha}(Ku)^{\beta}\epsilon$$
or: $$\log X = \log A + \alpha \log (Lv) + \beta \log (Ku) + \log \epsilon$$

Now we observe only L, K and X, and normally errors of observation in the independent variables would prevent one getting consistent estimates of α, β and A. But we can clearly write the above equation as:

$$\begin{aligned}\log X &= \log A + \alpha \log L + \beta \log K + \alpha \log v + \beta \log u + \log \epsilon \\ &= \log A + \alpha \log L + \beta \log K + w\end{aligned}$$

where $w = \alpha \log v + \beta \log u + \log \epsilon$.

All that is required to get consistent estimators of α and β by least-squares methods is to assume that the combined error term w is independent of $\log L$ and $\log K$.[1] This is a fairly general condition, and one suspects that it is frequently approximately true in practice.

IV

The most obvious empirical conclusion is that the economist should view with considerable suspicion "technologically" fixed proportions. In particular, technological rigidity does not imply economic rigidity. Substitution is much more important than may appear from considering the non-stochastic production function. Furthermore, this analysis casts additional doubt on the empirical validity of assumptions of fixed factor proportions in aggregate economic models—such as those of Professor Leontief.

We have shown that it does matter considerably when one introduces the stochastic elements into the theory of the firm. If they are introduced into factor services the results are quite different from the determinate non-probabilistic case and from the case where the probabilistic term is simply added to (or multiplied by) the production function.

A. A. WALTERS

Northwestern, Evanston, Illinois
and Birmingham, University.

[1] This method of estimation follows the theory of Joseph Berkson, "Are There Two Regressions?" *Journal of the American Statistical Association*, Vol. 45 (1950), pp. 164–80. See also, R. C. Geary, "Nonlinear Functional Relationships Between Two Variables when One Variable is Controlled," *Journal of the American Statistical Association*, Vol. 48 (1953), pp. 94–103.

INCOME DISTRIBUTION IN THE EDGEWORTH BOX DIAGRAM

THE problem to be discussed concerns the relationship between an income-distribution constraint and the efficiency conditions of exchange between two persons. It is well known that the Pareto conditions do not yield a unique allocation of resources, and that an additional constraint, such as income distribution or a specific market structure, must be introduced to complete the model. In this paper it will be shown that it is not generally true that a particular distribution of income is compatible with only one allocation of resources (*i.e.*, that there is a one-to-one correspondence between points on the contract curve and possible distributions of income). Consequently, there arises a certain logical difficulty connected with the usual definition of income distribution.

It is assumed that there are two consumers, I and II, having utility functions, $U_1(X_{11}, X_{12})$ and $U_2(X_{21}, X_{22})$, respectively, where X_{ij} is the consumption of the j^{th} commodity by the i^{th} consumer. The standard assumptions are made concerning these functions, that they are continuous, have continuous marginal rates of substitution, are monotonically increasing (*i.e.*, there are no points of satiation) and give rise to strictly convex indifference curves. The total quantities of the two commodities to be allocated between I and II are X_1 and X_2.

The contract curve is defined as the set of all points (or allocations of X_1 and X_2) for which the marginal rate of substitution between the two commodities is equal for the two consumers. At any point on the contract curve an equilibrium price ratio may be defined equal to the marginal rate of substitution at that point. In this model, of course, only relative and not absolute prices are determined.

Consider any point on the contract curve. I's allocation of resources will be $\bar{X}_{11}$ and $\bar{X}_{12}$, II's will be $X_1-\bar{X}_{11}$ and $X_2-\bar{X}_{12}$. Let the relevant equilibrium prices be p_1 and p_2. These are determined up to a positive factor of proportionality, a, *i.e.*, only relative prices are determined.

I's income can be defined as $a\left(\frac{p_1}{p_2}\bar{X}_{11}+\bar{X}_{12}\right)$, and II's income as $a\left[\frac{p_1}{p_2}(X_1-\bar{X}_{11})+(X_2-\bar{X}_{12})\right]$. The ratio of their incomes is

$$R=\frac{\frac{p_1}{p_2}\bar{X}_{11}+\bar{X}_{12}}{\frac{p_1}{p_2}(X_1-\bar{X}_{11})+(X_2-\bar{X}_{12})}$$

which, it will be noted, is independent of the absolute price level.

The definition of income used here is the same as that in the conventional theory of individual consumer behaviour. Given a, p_1 and p_2, $a\left(\frac{p_1}{p_2}X_{11}+X_{12}\right)$ defines a set of parallel lines on one of which lies the contract curve point $(\bar{X}_{11}, \bar{X}_{12})$. That line defines the set of alternative purchases confronting I from which he chooses, by assumption $(\bar{X}_{11}, \bar{X}_{12})$. Similarly, it may be seen that $a\left[\frac{p_1}{p_2}(X_1-X_{11})+(X_2-X_{12})\right]$ defines a set of parallel lines, on one of which lies the contract curve point $(X_1-\bar{X}_{11}, X_2-\bar{X}_{12})$. This line defines the set of alternative purchases confronting II from which he chooses by assumption $(X_1-\bar{X}_{11}, X_2-\bar{X}_{12})$.

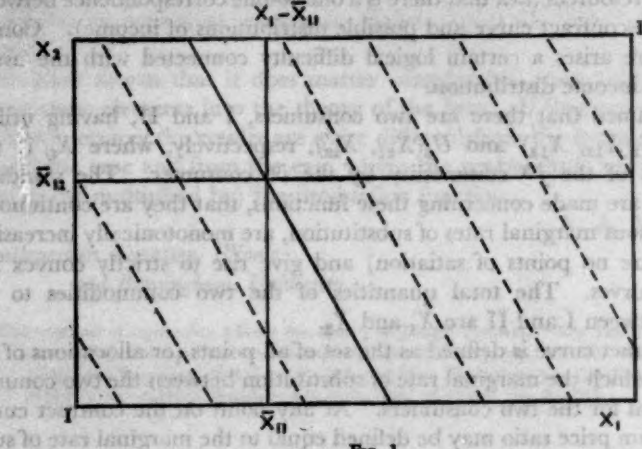

FIG. 1

In Fig. 1 it may be noted that the parallel lines defined by $a\left[\frac{p_1}{p_2}X_{11}+X_{12}\right]$ and $a\left[\frac{p_1}{p_2}(X_1-X_{11})+(X_2-X_{12})\right]$ are the same lines viewed from I and II respectively. Moreover, the unbroken line which goes through the point $(\bar{X}_{11}, \bar{X}_{12})$ and, looked at from I, defines I's income, looked at from II, defines II's income.

That no income distribution is incompatible with the efficiency conditions of the contract curve may be proved very simply. In the formula for R, by assumption, the quantities and prices vary continuously, so that R also varies continuously. At $X_{11}=X_{12}=0$ R also has be value zero. (Relative prices here are equal to the marginal rate of substitution of consumer II, and are non-zero, by assumption.) Similarly, at $X_{11}=X_1$ and $X_{12}=X_2$, R has the value infinity. Thus, R varies continuously along the contract curve taking all values between zero and infinity.

Given that R is a continuous function of the points on the contract curve, the interesting question is whether it is a monotonically increasing one. In the Edgeworth box illustrated in Fig. 2 A and B are two points on the contract curve. At B consumer I's utility is higher than at A and consumer II's is lower. It would be reasonable to say, therefore, that a move from A to B shifts income distribution in favour of I. The question is whether this is shown by R, that is, whether R at B is necessarily greater than R at A. It

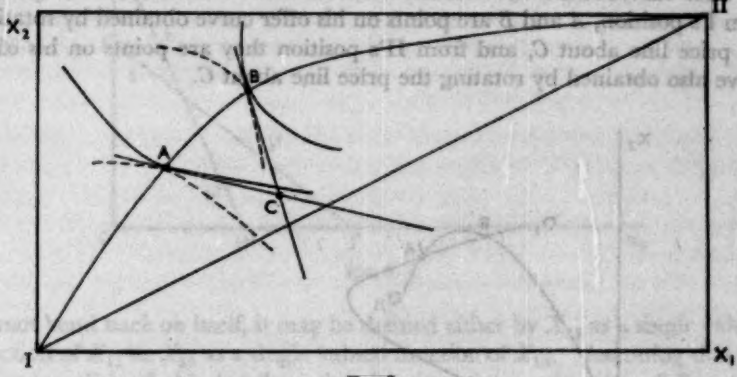

FIG. 2

can be proved that this is not the case and that R need not increase monotonically along the contract curve from left to right.

A necessary and sufficient condition for R at B to be less than R at A is that when the budget line through B is steeper than the budget line through A the lines intersect above the diagonal, and when the budget line through B is flatter than the budget line through A the lines intersect below the diagonal.

Let the point of intersection be C. At the equilibrium prices ruling at A income distribution at C is the same as that at A, and at the equilibrium prices ruling at B income distribution at C is the same as that at B. In comparing R at A with R at B, therefore, it suffices to consider the behaviour of the ratio

$$\frac{\frac{p_1}{p_2}X'_{11} + X'_{12}}{\frac{p_1}{p_2}(X_1 - X'_{11}) + (X_2 - X'_{12})}$$

as $\frac{p_1}{p_2}$ varies, where (X'_{11}, X'_{12}) are the resources allocated to I at C. The derivative of this expression with respect to $\frac{p_1}{p_2}$ has the same sign as the expression $X_2X'_{11} - X_1X'_{12}$. Thus, for R at B to be less than R at A either $\frac{p_1}{p_2}$ is

greater at B and $\frac{X_2}{X_1} < \frac{X'_{12}}{X'_{11}}$, or $\frac{p_1}{p_2}$ is smaller at B and $\frac{X_2}{X_1} > \frac{X'_{12}}{X'_{11}}$. Fig. 2 illustrates the former case. The latter case is entirely symmetrical except that A, B and C are now all underneath the diagonal instead of being above it as in the diagram.

Another way to approach this theorem is to consider the initial non-equilibrium point C. The situation under discussion is then one in which the offer curves of the two consumers intersect more than once. Regarded from I's position, A and B are points on his offer curve obtained by rotating the price line about C, and from II's position they are points on his offer curve also obtained by rotating the price line about C.

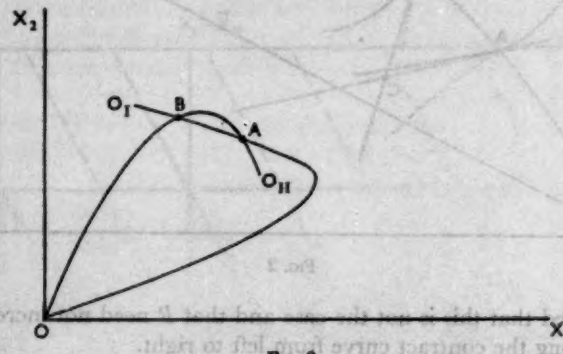

FIG. 3

In Fig. 3 O_I is I's offer curve, I offering X_1 in exchange for X_2, and O_{II} is II's offer curve, II offering X_2 in exchange for X_1. O_I and O_{II} intersect more than once, points A and B in Fig. 3 corresponding to A and B in Fig. 2. A and B are, therefore, equilibrium points reached by quantity-adjustment from C.[1]

The fact that R is not a satisfactory measure of real income distribution is, of course, merely another example of the index-number problem.

In Fig. 4 it is impossible to say whether the individual's real income is higher on HH' or JJ' without knowing whether h or h' and j or j' are the corresponding equilibrium points. This is precisely what is happening in the Edgeworth box, and is a phenomenon which indexes such as R are unable to take into account. Indeed, the general point discussed in this paper will hold for any measure of income distribution which is solely a function of money income and prices.

[1] An interesting corollary which may be obtained, therefore, concerns the definition of income distribution at points off the contract curve such as C. If it is argued that this should be measured at the relative prices ruling at the quantity-adjustment point reached from C, contradictions may arise, because there may be several such points.

A final conclusion to be noted is that if there are any points on the contract curve for which R is an unsatisfactory measure of income distribution, there will be an infinite number of such points. Since the contract curve

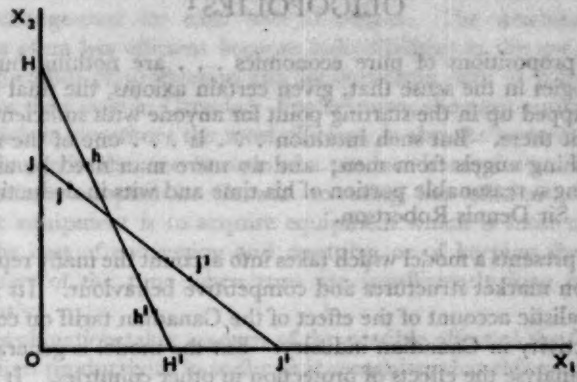

FIG. 4

cannot bend back on itself, it may be defined either by X_{12} as a single valued function of X_{11} or X_{11} as a single valued function of X_{12}. Assuming that the former condition holds, it follows that R is a continuous function of X_{11}.

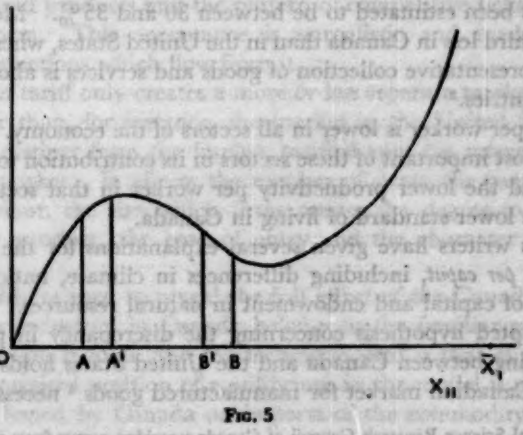

FIG. 5

In Fig. 5 R is shown as a function of X_{11} illustrating the theorem. Since R at B is less than R at A, and R is continuous, there must be a range of points A' and B' between A and B such that R at B' is less than R at A'.

M. H. PESTON

London School of Economics.

A MODEL FOR THE STUDY OF PROTECTED OLIGOPOLIES[1]

". . . propositions of pure economics . . . are nothing but glorious tautologies in the sense that, given certain axioms, the final result was all wrapped up in the starting point for anyone with sufficient intuition to see it there. But such intuition . . . is . . . one of the marks distinguishing angels from men; and no mere man need be ashamed of spending a reasonable portion of his time and wits in deductive reasoning." Sir Dennis Robertson.

THIS paper presents a model which takes into account the many repercussions of a tariff on market structures and competitive behaviour. Its purpose is to give a realistic account of the effect of the Canadian tariff on competition and productivity in Canadian industry. But the model is general and can be used to analyse the effects of protection in other countries. It may be of interest for an analysis of economies that are about to change the present nature and degree of their protection.

A fundamental characteristic of the Canadian economy has been in the past and is today the lower real output *per caput*, and the consequently lower standard of living, than in the United States. The differential in real output *per caput* has been estimated to be between 30 and 35%. Money income is about one-third less in Canada than in the United States, whereas the money cost of a representative collection of goods and services is about the same in the two countries.[2]

Output per worker is lower in all sectors of the economy. Manufacturing is the most important of these sectors in its contribution to gross national product, and the lower productivity per worker in that sector is the main cause of the lower standard of living in Canada.

Previous writers have given several explanations for the differential in real output *per caput*, including differences in climate, national character, abundance of capital and endowment in natural resources.[3] But the most widely accepted hypothesis concerning the discrepancy in productivity in manufacturing between Canada and the United States holds that the small size of the Canadian market for manufactured goods [4] necessarily results in

[1] The Social Science Research Council of Canada provided grants for a study of which this paper is a part.

[2] J. H. Young, "Some Aspects of Canadian Economic Development" (unpublished Ph.D. dissertation, Cambridge University, 1955).

[3] *ibid.*

[4] The median ratio of United States to Canadian industry size was 10, with quartiles at 8 and 13 in 1947. G. Rosenbluth *Concentration in Canadian Manufacturing Industry*, National Bureau of Economic Research, Number 61, General Series (Princeton: Princeton University Press, 1957), p. 82.

sub-optimal scale for plants and firms, with a consequent loss of productivity.[1] Those who argue from the small size of the Canadian market show that runs of single products in Canadian factories are shorter than in their counterparts in the United States, with the result that much more time is used in change-over for each unit of output. The machinery used in Canada is often less efficient because indivisibilities in the use of the most efficient methods of production can be overcome only at higher scales of production than exist in Canada. Furthermore, the most automatic equipment, which is sometimes the most efficient, is also the most costly to reset when a change in the size or style of a product is required. The alternative sometimes adopted in Canada to using less efficient or less fully automatic equipment is to acquire equipment which is most efficient and to bear the cost of conversion and resetting, or of keeping the machinery idle for part of the time when runs are insufficiently long to operate it continuously.

This explanation takes account of the possible effect of the foreign tariff on Canadian productivity in so far as it recognises that this tariff may limit the size of the market in which Canadian producers can compete with foreign producers on equal terms. But it goes both too far and not far enough: too far in assuming that the foreign tariff reduces markets open to Canadian producers to a level at which efficient organisation is impossible in most cases; not far enough in accepting as given the existing structure of markets for manufactured products and the pattern of competitive behaviour which prevails in them. This acceptance is unrealistic and inadequate, and vitiates the deductions which flow from it.

The foreign tariff only creates a more or less separate market in Canada that is smaller than, for instance, the market in the United States. The Canadian, as distinct from the foreign, tariff shapes the internal organisation of each market. It affects the number of firms, the pattern of competitive behaviour, the size which firms attain, the degree to which they diversify their product, the ease of entry and the character of potential entrants.

The model here used to reveal the full effect of the Canadian tariff on manufacturing industries in Canada belongs to the familiar genus of particular-equilibrium models, and the technique used is that of comparative statics. The original position of equilibrium in the model is one in which no duties are levied by Canada on imports of the commodity under consideration. It is also assumed that foreign countries tax exports from Canada, and that Canada erects a tariff against imports of some one commodity. The new equilibrium is described and compared with the old. Each country levies dumping duties on imports equal to the difference

[1] D. H. Fullerton and H. A. Hampson, *Canadian Secondary Manufacturing Industry*, Royal Commission on Canada's Economic Projects (Ottawa: Queen's Printer, 1957). This is the most recent and full treatment of the problem from this point of view.

between the price at which a supplier sells in his domestic market and the price at which he sells in that country's market, when the former price is higher than the latter.

In the long run the Canadian tariff affects the number of firms competing in the Canadian market and is one of the factors which determine the scale of their operations. Entry into markets for manufactured goods is affected by the presence in Canada of two special factors which operate together with the other forces affecting entry.[1] These factors are the foreign tariff imposed against Canadian goods and the Canadian tariff imposed against foreign goods. The foreign tariff creates a small market in Canada separate from the world market. The size of the separated market constitutes an impediment to entry whenever it is small in relation to the optimum scale of the firm. The Canadian tariff, on the other hand, increases the maximum price which can be charged in the protected market without attracting imports. Thus, *ceteris paribus*, the Canadian tariff is always an inducement to the establishment of firms in the Canadian market. The effect of protection on entry is the result of these two opposing consequences of the existence of a foreign and a Canadian tariff. It is independent of other barriers to entry, such as product differentiation, marketing barriers and absolute cost advantage accruing to existing firms.

The extent to which the effect of the foreign tariff is a deterrent to entry depends, other things being equal, on the relation of the minimum optimum size of the firm to the size of the relevant market. The minimum optimum size of the firm is the smallest size of firm at which all economies of large-scale operation become exhausted. The principal determinant of this minimum optimum size of the firm is the minimum optimum size of the plant. However, the size of the plant is likely to set only the lower limit to the optimum scale of the firm, because instances of diseconomies of multi-plant operations are rare: in most cases multi-plant operations either bring economies or are neutral, other impediments to growth than economies of scale being responsible for limiting the size of actual firms. These other impediments are negatively sloped average-revenue curves facing the firm, rising selling costs which result from product differentiation and non-price competition, the unwillingness of the entrepreneurial group to expand at the risk of losing control, limits imposed by the ownership of resources, other institutional reasons, and accident.[2]

Economic analysis has added little to our understanding of the forces that determine the minimum optimum scale of plant since Adam Smith described them in his account of the efficient operation of pin factories. Principles

[1] These other forces are described by Joe S. Bain in *Barriers to New Competition* (Cambridge, Mass.: Harvard University Press, 1956).

[2] Alfred Marshall's analogy between the pattern of growth of trees and of firms has received recently statistical conformation in H. A. Simon and C. P. Bonini, "The Size Distribution of Business Firms," *American Economic Review*, Vol. XLVIII, No. 4, September 1958, pp. 607–618.

such as those of specialisation of labour and process, indivisibility, economies of increased dimension, pooling of risks through large numbers and of balanced structure of equipment at the various stages of production are used by economists only to describe and not to analyse technological and organisational determinants of optima. For the investigation of existing markets and their structure, the general principles, which never operate in isolation, are of little help. Therefore, it is necessary to obtain in each specific instance estimates of the minimum optimum size of plant and firm based on engineering and organisational experience.

The minimum optimum size of plant must be carefully defined. The size of plants is usually given in terms of the value of output, or of the physical quantity of input of raw material or of output of finished goods. Such measures are insufficient for the purpose of determining the minimum optimum scale of plant. They must be supplemented by information concerning the variety of products whose value or tonnage or input requirement is given, for it is usually the case that a diversified output of a certain value or volume has higher costs per unit than an undiversified output. A minimum optimum size of plant therefore implies the output of a basket of products requiring the least costly adjustments, the use of the most efficient equipment and the least idle time for the equipment. A firm of minimum optimum size is made up entirely of plants of the minimum optimum sizes, the number of plants being determined by economies of scale available to the firm as distinguished from individual plants.

The minimum optimum size of firm in the Canadian market [1] is not a single value, for it depends on whether the firm is an entirely separate entity without affiliation with foreign firms or whether it can rely on foreign firms for certain services and supplies. Firms which are independent can overcome indivisibilities in research, product design, marketing and the supply of parts and components by taking advantage of external economies, that is, by purchasing their requirements from specialised firms. However, specialised firms are often not available to supply all these indivisible needs of independent firms, and therefore the minimum optimum size of firm must in these cases be large enough to warrant the inclusion of the indivisible operations in the scope of the firm's activities. In contrast, affiliates of foreign firms operating in Canada can usually overcome all of these indivisibilities by acquiring from the foreign associates all the needed goods and services that are not available on the market and require large-scale operations to make them economically feasible. Thus the scale at which independent producers attain minimum optimum size of operations is likely to be significantly larger than the minimum optimum scale of Canadian affiliates of foreign producers. Wherever this is so, given the market size,

[1] The Canadian market is the market open to Canadian producers, whether in Canada or abroad. In fact, most Canadian producers of manufactured products sell chiefly in the domestic market.

the barrier to the entry of independent firms is higher than to firms which can rely on others for certain services and parts.

As Bain has pointed out, entry is impeded where the output of a firm of minimum optimum scale would supply a large proportion of the firm's market because the new entrant either commences production at the minimum optimum scale, thereby depressing the price, or it enters at sub-optimal scale and thereby incurs the penalty of higher cost, though it does not depress price as much. Choice between these two courses of action on the part of the new entrant depends on estimates of the effect on the price of the product of entry at different scales, and on estimates of the effect on costs of reductions in scale from the minimum optimum. Thus, other things being equal, the steeper the envelope curve to the left of its lowest point or points, the less elastic the aggregate demand curve in the market, and the stronger the probable reaction of existing firms, the greater the barrier to new entry.

Given the minimum optimum scale of firm, the shape of the envelope curve, the elasticity of aggregate demand and the probable reaction of rivals, the impediment to entry depends on the size of the market. This market must be measured by the amount of the commodity produced in Canada. However, this measurement is only an approximation of the dimension of domestic and export markets which would exist if in fact all firms in Canada were of the optimum size. In so far as they are not, their costs are higher, and therefore measurements obtained from statistics of actual production are a low estimate of the potential size of Canadian markets, because lower costs might bring lower prices. Moreover, the definition of the commodity or groups of commodities sold in the market presents problems identical to those of the definition of the commodity or group of commodities produced by the plant.

The discussion up to this point leads to the conclusion that entry into a Canadian market by production in Canada is easier the smaller the minimum optimum size of firms in relation to the relevant market. The relevant market is not in all cases the national market. Regional sub-markets exist, usually because of high transportation costs created by low value in relation to bulk or weight, perishability of product and servicing problems. In supplying regional markets, a firm has the choice between concentrating production under a single roof, thus incurring transportation costs, and supplying each region from a plant located in it. In the latter case the firm may be unable to operate plants of minimum optimum size if some regional markets are not large enough to accommodate one. Thus, a firm made up of several sub-optimal plants may appear to be of the minimum optimum size or larger, whereas, in fact, its average costs are higher than those of a firm operating plants of the most efficient size. It should be noted, however, that high transportation costs can be prevented to some extent from creating regional sub-markets by collusive pricing policies such as those employing basing points or identical delivered prices. One of the incidental effects of

the Canadian tariff, which imposes an artificial transportation cost on foreign producers, is that it permits oligopolistic Canadian industries so to price their products as to merge some of the regional markets. In the absence of the tariff each region would be part of a larger international market. Each market would be supplied by the least-cost producer, taking transportation costs into account. Thus, a determination of the minimum size of the Canadian market which uses statistics on existing markets overlooks the problem of regional distribution of demand, and may cause an overestimate of the size of markets which would exist without the protection of the Canadian tariff.

In the following analysis the foreign tariff is treated as one of the given conditions which determine the size of the market open to the Canadian producers in each industry. The imposition of the Canadian tariff is the force which disturbs the initial equilibrium and, therefore, is the force whose consequences in the long run are analysed. The maximum to which the Canadian price may be put up as a result of the imposition of the Canadian tariff acts differently as an inducement to entry in each of the main market types, competition, monopoly and oligopoly, because the process of price formation is not the same in each of these market types and, therefore, a given rate of protective duty has different consequences in each case. The simple models that can be used to analyse the impact of the Canadian tariff on industries that are perfectly competitive or monopolised are omitted from this discussion. Manufacturing industries tend to be oligopolies in Canada and in the United States, which is the principal supplier to Canada of manufactured products at present. Therefore, the case of chief interest is that of the impact of the tariff on oligopolistic market structures which exist both abroad and in Canada.

After the Canadian tariff is imposed, an oligopoly in the Canadian market results because an oligopoly existed in the world market prior to the imposition of the tariff and the firms located in Canada, now more isolated, form the nucleus of a domestic oligopoly. Alternatively, if prior to the imposition of the tariff producers did not exist in Canada, the tariff may create a Canadian industry which is oligopolistic.

If the oligopoly is not collusive, oligopolists tend to keep their prices close to the minimum long-run average cost of firms of optimum size. If the number of oligopolists is small they keep their prices low because of the fear that their rivals may pursue this policy themselves, because of the fear that new entrants may be attracted by high prices if they do otherwise and because of the fear of imports when their costs are little below world prices plus duty. If the number of oligopolists is large they are compelled to keep their prices close to the lowest point on their envelope curve because their rivals do, in fact, cut prices under them if they keep prices high and entry of new firms actually takes place under the same conditions. Moreover, should prices be pushed up by costs and temporarily exceed world price plus duty,

they are soon pulled back by a flow of imports. In the case where there are several oligopolists, the structure of the industry may well be unstable because of an inflow and outflow of firms and because of changes in the size of existing firms caused by alternating periods of high prices and intense competition.

If the oligopoly is collusive, price is fixed at a level which takes into account the threat of potential competition from imports and from new entrants. In the case where, in the view of the oligopolists, the appropriate profit maximising policy requires their continued domination of the market, price tends to be fixed at a level below world price plus duty and tends towards the minimum long-run average cost of the firm of optimum size. On the other hand, if it is the oligopolists' view that profits can be maximised by a policy of charging high prices, these prices attract new entrants, and thus more firms become established in the market than can be accommodated at a price that covers the minimum average costs of firms of optimum size. The ensuing market structure is one in which the number of firms is large, the scale of firm is sub-optimal and average costs are high. Thus, the high price tends to be justified in terms of high costs by the market structure which it produces. In the case where economies of scale place insuperable barriers to entry, firms tend to be of the optimum size and high prices make for permanently high profits.

This discussion of the effect of tariffs on oligopolies in Canadian manufacturing industry has neglected so far all barriers to entry that are not related to economies of scale. Each of the other barriers to entry is now discussed in turn, and in conclusion the overall barrier is considered. If product differentiation and marketing create barriers additional to those owing to the net effect of tariffs, collusive pricing becomes more likely. Product competition provides an alternative to price competition when products are heterogeneous, and the fear of new entrants attracted by high prices is reduced by the barrier erected by differentiation. As was noted above, pricing up to the tariff is likely whenever a substantial barrier to entry exists, and it is therefore more likely with product differentiation and marketing barriers than without. Given the level of price, probably determined in collusion, the structure of the market depends on the height of the barriers created by the net effect of tariffs, product differentiation and marketing, and the character of the latter barrier.

Where the barriers created by product differentiation and marketing are slight and the deterring effect of the foreign tariff is small in relation to the inducement to entry offered by the Canadian tariff, that is, where the increase in cost incurred from operating a firm of sub-optimal size is small in relation to the increase in price made possible by the Canadian tariff, the probable market structure is one in which several firms of sub-optimal scale resort to non-price competition to sell differentiated products which are close substitutes.

If the barrier provided by product differentiation and marketing is high, the size of the firms is likely to be closer to the optimum and marketing costs are probably high in the sense that profits may be no higher than the average in manufacturing as a whole. Indeed, in industries where economies of scale are unimportant, product differentiation is likely to depend on large advertising expenditures because brands are numerous in such industries or at least potentially numerous. Heavy expenditures on advertising and marketing are required to establish the identity of each existing brand and to prevent the creation of new popular brands. Large selling outlays become possible when the products are strongly differentiated and a margin is available between production costs and price to finance such outlays. Where economies of scale are important, actual and potential brands are fewer, and relatively smaller advertising outlays are sufficient to establish the identity of each product *vis-à-vis* its rivals. In the aggregate, advertising outlays of these industries need not be large to create a barrier against newcomers, and profits are abnormally high.

It should be noted that in markets where product differentiation is important subsidiaries or affiliates of United States firms have a considerable advantage over independent firms in Canada. This is so owing to the fact that the policies of United States firms directed at creating barriers to entry in United States markets through product differentiation also create, as a by-product, preference for their product in Canada because of the considerable exposure of Canadian consumers to American advertising media. Economies of large-scale advertising are marked, and the cultural similarity of the United States and Canada is sufficient to permit the successful extension of American advertisements to Canada. The marginal cost is low of using in specifically Canadian contexts with little or no adaptation the very expensive and presumably persuasive advertisements used by parent companies of Canadian firms in the United States. The total sales of independent firms are often too small to support the most effective advertising.

The discussion of the effect of tariffs when absolute cost advantages enjoyed by established firms constitute the barrier to entry proceeds by the consideration of each kind of advantage in turn: resource ownership, patents and techniques for the control of production, and imperfections in the input markets. If the ownership of a resource by established firms constitutes a barrier to entry in the world market the imposition of the tariff may result in the creation of an oligopoly in Canada whether foreign production is carried on by a monopolist or by oligopolists. For instance, this may be the case when foreign producers are integrated disproportionately at the several stages of production and sell their raw or semi-processed materials at a high price calculated to block entry into the world market for the final product. The protected Canadian processors may be able to purchase their raw or semi-processed materials at the high prices charged by the integrated foreign producers and establish production behind the tariff.

If resources are located partly in Canada and partly abroad the oligopoly which appears in the Canadian market has characteristics determined by the net effect of tariffs on entry and the nature of the barrier erected by resource ownership. If resources are in many hands the net effect of tariffs determines the size and number of firms. In the more usual case in which ownership of resources is concentrated it is resource ownership rather than the net effect of tariffs that determines the size of firms. Hence, resource ownership may lead to firms of much larger than the minimum optimum scale either if the long-run average cost curve is horizontal once it has attained its minimum level or if the effect of the Canadian tariff permits higher than minimum costs. In such a case collusion and pricing up to the tariff is likely with above-average profits permanently maintained unless a part of them is absorbed by high costs of production at a greater than optimum scale, or by selling costs. However, high selling costs are unlikely in a resource-based industry.

Patents and other methods of controlling techniques of production, such as secrecy concerning engineering processes, affect the structure of an industry in the same manner as does the ownership of resources. However, in so far as patents are vulnerable to attacks of public opinion and government policy, they are less durable. Patents and other forms of control over techniques of production may form an absolute barrier to entry into the industry in question, or they may merely oblige competitors to incur higher costs by employing inferior methods or to produce inferior products, depending on how easy it is to circumvent the patents or the other obstacles to production, and depending also on the presence of close substitutes in consumption. Where these forms of control erect absolute barriers to entry, the maximum number and size of firms in the industry is determined by the licensing policy, and by policy with regard to sharing secrets on the part of the owners of these controls. Where a sufficient number of patented or otherwise controlled processes exist to permit new firms to enter should the net effect of tariffs induce them to do so, these controls cannot be considered to form an absolute barrier to entry, even though they themselves cannot be duplicated without the acquiescence of the owners. Where these forms of control make entry into the industry difficult but not impossible, the number and size of firms in the industry is determined by the combination of the net effect of tariffs and of cost disadvantages imposed by the necessity of relying on inferior methods of production, on inferior products, or on payment of royalties to the holders of patents and of fees to possessors of special knowledge.

Where the number of firms in the industry is kept low by the net effect of tariffs and by controls over techniques of production, and where the fear of potential entrants is remote, a tendency to collusion exists. Either profits or costs are high, depending on the absence or presence of competition through marketing expenditures.

The barrier to entry formed by controls over techniques of production is likely to be higher for independent producers than for affiliates of foreign firms, because the latter are the principal holders of patents in Canada owing to earlier technological development in the United States, the United Kingdom and Continental Europe. Foreign owners of patents are more likely to make them available to their affiliates than to license independents. Foreign corporations are also under some compulsion to establish affiliates in Canada in order to safeguard their patent rights. As for technological knowledge, which is a by-product of production itself, it is likely to be passed on to the personnel of affiliates and not to be sold to independents, for few firms are in the business of selling knowledge.

The last barrier to entry whose effect in conjunction with the imposition of the Canadian tariff must be considered is the well-known one which arises from imperfections in the market for inputs. These imperfections work to the advantage of some established firms, thereby making entry more difficult for others. The most important of the markets in which these imperfections exist, and typical of markets where problems may occur with respect to other inputs, is the market for capital. The operation of this market works to the advantage of firms which are absolutely large. Such firms obtain capital more readily than small ones because, with the existing institutions in the capital market, the cost of catering to their needs for finance are lower, and also because of the oligopsonistic power of large firms.[1] Furthermore, the internal resources of large firms provide them with absolutely large pools of capital which notoriously escape interest rates charged in the market to enterprises of a similar character. Thus, once again, a barrier to entry of new firms is greater for independent firms than for the affiliates of established foreign producers, many of whom are absolutely large. Indeed, in many instances this barrier, which is absolute to independent firms, does not exist for affiliates.

The model presented in this paper for the analysis of protected oligopolies suggests some conclusions important for public policy. First, a widely advanced argument in support of protection in Canada claims that foreign tariffs so reduce the efficiency of the Canadian producer by restricting the size of the market available to him and thereby forcing a small scale upon him that his costs and, therefore, the domestic price are raised to the point at which, paradoxically, he requires protection himself. This argument could apply only where the Canadian market, national or regional, is served by a single firm whose scale is below the minimum optimum scale for firms in that industry. As soon as the relevant market contains more than one firm, the argument that it is the foreign tariff which forces small scale on Canadian producers falls down: the small scale must be owing to some other factor. In fact, few markets in Canada are served by only one firm.

[1] R. F. Henderson, *The New Issue Market and the Finance of Industry* (Cambridge: Bowes and Bowes, 1951).

Cases exist in which oligopolies in Canada are already as efficient as their foreign counterparts and yet are not able to export because of foreign tariff protection. In these cases, if there are no diseconomies of production at greater than existing scale, the removal of foreign tariffs may increase the scale of operation of firms in Canada. If there are no differential locational disadvantages for new entrants in Canada the removal of foreign tariffs may increase the number of firms. Thus, in certain circumstances the removal of foreign tariffs may increase firm size or the number of firms or both, but these are clearly not cases in which the inability to export to foreign countries because of foreign tariffs reduces the efficiency of the Canadian oligopoly below levels of efficiency achieved abroad. At most, foreign protection affects the size of the Canadian industry. Whenever an inefficient oligopoly exists in Canada, the question necessarily arises of why prices are not cut to eliminate some firms and to permit the increase in size of the remaining ones. Foreign tariffs are of only peripheral significance in this matter.

Another case exists in which the foreign tariff may conceivably affect adversely the efficiency of Canadian industries. In so far as external economies are important, Canadian manufacturing industries would be more efficient if they were larger. Since some of these industries would be larger if there were no foreign tariff, they would also be more efficient. In so far as external economies of firms in one industry are internal economies of firms in other industries, the model takes them into account in its discussion of the cost curves of the latter group of firms. In so far as economies are external to all firms, it is impossible to analyse this phenomenon in a general way. However, an attempt can be made to identify the sources of external economies and to determine their significance in each specific industry.

Second, there is the widely expressed concern with the effect of the inflow of foreign capital on the performance of the Canadian economy. The model indicates that impediments to the establishment of foreign subsidiaries would reduce the productivity of Canadian industry below its present level. The effect of the foreign tariff makes entry into Canadian industries difficult. Any reduction in the minimum optimum size of firms offsets the effect of foreign tariffs, tends to maintain competitive conditions and makes more likely the establishment of efficient firms. Since affiliates of foreign firms can enter at lower scales than independents, foreign direct investment is beneficial in this respect.

Third, it is evident that the extent of the market is not often a limit on specialisation in production. The productivity of oligopolistic firms can be raised, without increasing the size of the market, if competitive pressure can be brought on their prices and costs. Such pressure may result in a reduction in the range of products supplied or in advertising and marketing costs, and it may also result in the elimination of some of the firms in markets where

the net effect of tariffs has produced overcrowding. As is often the case, the goals of public policy conflict: efficiency requires fewer units of larger size, and competition requires many units. Once competitive pressures have led to efficiency, measures must be applied vigorously to prevent collusion, and to force the few efficient units to pass on to the consumer gains in productivity obtained from the reorganisation of the market. Tariff reductions may also be useful instruments for increasing competition, for they force increases in the scale of such sub-optional firms as are able to face foreign competition and reduce overcrowding.

STEFAN STYKOLT
HARRY C. EASTMAN

University of Toronto.

THE WITHDRAWAL OF RAILWAY SERVICES[1]

I. Introduction

The increasing rate of withdrawal of the less remunerative of the services provided by British Railways has made more important the accurate measurement of the costs and receipts of individual services within the railway system. This paper discusses:

(*a*) the measurement of total costs and receipts attributable to an individual service;

(*b*) the estimates of expected *changes* in costs and receipts upon withdrawal of a service;

(*c*) certain analytical flaws in the criterion used in the construction of such estimates, for the examination by the consultative committees[2] of any proposal to withdraw a service. The form of the criterion is not laid down in the Transport Acts and, indeed, has changed in various respects over the past eight years. The present form, which will be referred to as the agreed scheme, was established in discussions held in 1958 between the British Transport Commission and the Central Transport Consultative Committee.[3]

II. Receipts

The measurement of *total* receipts earned by an individual service is in itself a difficult problem. For passenger traffic, British Railways currently take two sample weeks in each year, and for these weeks a count of passengers boarding and alighting at each station is made by the station staff; from this, a figure for receipts is obtained by multiplying by the average fare for the Region. There are several possible sources of error: the use of the average fare for such a large entity as a Region may be inappropriate to the particular service;[4] the sample results may not be representative of the year as a whole because of seasonal variations; and the method of collecting the data permits falsification of the results by the local staff (who are interested parties), a danger of which the railway officers are well aware.

These results are used merely to give the railway management a rough idea of the revenues of each line. When withdrawal of services is mooted

[1] The writers have benefited from discussions with various persons, including certain members of British Railways' staff. These persons do not necessarily share the opinions of the writers expressed in this article.

[2] For the constitution, and other functions, of the consultative machinery see the Transport Act, 1947, Section 6, and C.T.C.C. *Handbook on Transport Users' Consultative Committee* (London, no date).

[3] The form of the agreed scheme is laid out in the Appendix of the C.T.C.C.'s *Annual Report for 1958* (H.M.S.O., 1959).

[4] In at least one Region attempts are being made to use rates per mile for particular services rather than the average fare for the whole Region.

a more thorough analysis is made, covering a short period, usually one month, from which an estimate of annual receipts is obtained, after making some allowance for seasonal variations. For the purposes of this analysis, passenger traffic is divided into three categories: (*a*) traffic local to the line; (*b*) traffic which is forwarded from a station on the line to a station not on the line, or vice-versa; and (*c*) traffic which passes over the line but which originates and terminates at stations not on the line. The first category is usually the most important; the third category applies, of course, only to lines having at least two points of connection with the rest of the system. The methods used for the measurement of receipts vary from case to case, but the following details give some idea of the general approach. In the first category receipts are measured in the obvious way, namely by finding the value of the tickets sold. In the second category the sales of tickets at stations on the line are examined and a proportion of the value (that part relating to mileage travelled on the line itself) is used as the measure of receipts. The corresponding proportion of receipts from tickets sold at other stations is included only if such tickets are an important part of the total traffic,[1] in which case the tickets collected at stations on the line are examined. Similarly, the third category is ignored unless it is of importance; if this is so, the passengers must be counted directly, since their tickets are not collected at any point on the line itself. This number is multiplied by the fare for the distance travelled on the line to give an estimate for this class of receipts. Though basically sensible, much approximation is involved in these methods, with the consequent possibility of error. For freight and parcels traffic, data is available from ordinary working records.

Having thus estimated total receipts earned by the line, there is then the problem of estimating what part of those receipts will be lost in the short run to the railway system as a whole when the rail services in question are withdrawn. In general, the proportion lost is greatest for the first category and least for the third. This is illustrated by British Railways figures relating to passenger traffic on the St. Ives–Kettering line, where passenger services were withdrawn, and parts of the line closed completely, on June 15, 1959:

TABLE I

Annual Passenger Receipts and Estimated Loss, St. Ives–Kettering Line

	Receipts, £'000	Estimated loss of receipts, £'000	Estimated loss as a proportion, %
(*a*) Local	1·3	1·3	100
(*b*) Local/through	12·2	8·9	73
(*c*) Through/through	25·2	1·8	7
Total	38·7	12·0	31

[1] But when return tickets are purchased at stations on the line the value of both parts of such tickets is included in the analysis, and hence the corresponding incoming journeys are always taken into account.

The "receipts" column relates to mileage travelled on the line itself; [1] on withdrawal of the passenger services *all* these receipts are lost. The "estimated loss" column refers to the system taken as a whole. Some receipts elsewhere may also be lost after withdrawal, but, alternatively, some passengers may travel more extensively on the rest of the system; the *net* effect may be positive, neutral or negative. For receipts in the first category, unless there is a highly convenient alternative rail route between two or more of the stations on the line from which the service is to be withdrawn there would be no extra receipts elsewhere to compensate for the loss of local traffic. Similarly, in the second category one would expect increased receipts elsewhere only if at least two of the stations are junctions with the rest of the system. The estimate shown in Table I rests on the assumption that extra travelling on the rest of the system will cause a net increase in receipts for that part of the system of about £3,300 per annum (being the difference between the entries in the first and second columns). This type of estimate is based on a knowledge of the nature of alternative public transport, convenience of changing from bus to train, distances involved and so forth. In the third category the likelihood of passengers using an alternative rail route is higher: the table shows that a net increase in receipts of about £23,400 is expected for the rest of the system. In summary, the estimated (opportunity) loss of receipts to the system as a whole is frequently, but not invariably, less than the receipts on the line itself. The proportion lost depends upon local circumstances, the evaluation of which rests largely on personal judgment.

The short-run estimates just described exclude long-run factors on the demand side, notably the effect of car-ownership. But in the long run it seems reasonable to expect that the withdrawal of public-transport services will, by reducing the proportion of journeys which can be undertaken by such transport, encourage private individuals and firms to buy their own cars and trucks. Thus, because services are withdrawn from part of the rail system, receipts on the rest of the system are eventually likely to decline after any short-run rise, and the final level of receipts earned on that remaining part may well prove to be lower than the level obtaining on that part before the withdrawals take place.

III. Costs

In the past the railway companies did not usually cost individual services, even though to do so might have been possible in principle, though perhaps expensive in practice. After nationalisation, a Traffic Costing Service was set up; but only in the last few years, when there has been greater freedom to vary freight charges according to the costs involved, and when investment and disinvestment proposals under the 1955 modernisation

[1] Among the lines closed by British Railways it is unusual to find one where local traffic forms such a small proportion of the total.

plan have required evaluation, has British Railways been encouraged to discover more about the costs of individual units. Thus, the agreed scheme now requires that " the estimates of savings will be based as far as possible upon local conditions. Where the figures available relate to an entity larger than the branch line under consideration (*e.g.*, as regards coal consumption or repairs to locomotives) the estimates made will take to account the circumstances of the workings on the branch line concerned." [1] This requirement followed criticism made by the C.T.C.C. of the basis of the cost estimates presented at the Lewes–East Grinstead inquiry.[2] In these estimates broad, unqualified regional averages were applied to the costing of the small branch line concerned. Although these criticisms were justified, it must be remembered that in many instances the use of some form of average is inevitable. Take coal consumption as an example: where a locomotive hauls several different types of train during a single shift it is far too costly to measure how much coal has been consumed in the working of each type. In the Lewes–East Grinstead case (where the locomotives concerned did not work exclusively on that line) the coal-consumption figure used was based on an average for the whole of the Southern Region. However, the Traffic Costing Service has so developed in recent years that the averages now used relate to entities which are smaller and more relevant than the whole region. In some regions at least the procedure is to select for examination some locomotives which work exclusively on main-line expresses, some on nothing but cross-country stopping trains and so on. Coal consumption (per train mile, etc.) can be ascertained for each of these categories, and hence estimates of total coal consumption on any particular line can be built up from this basic data. Though this method still does not measure actual consumption and though differences in geography, traffic density, etc., will lead to inaccuracies, the new method is almost certainly more reliable than the old.[3]

In costing any service the first task is to ascertain what factors are used; these include train crews, station and signalling staff, permanent-way maintenance staff, rolling stock, fuel, buildings, bridges, tunnels, permanent way and a share of the central organisational staffs. Many of these factors (*e.g.*, station staff) are frequently used exclusively for the service in question, and hence their costs can be uniquely ascribed to that service. But some factors (*e.g.*, a motive-power depot) are used jointly by several services. In order to estimate the *total* costs of a single service, an allocation of joint costs is inevitable; however, when estimating the costs which could be avoided

[1] C.T.C.C., *op. cit.*, p. 16.

[2] See C.T.C.C., *Proposed Withdrawal of Train Services from the Lewes–East Grinstead Branch Railway*, February 1958, Cmnd. 360, subsequently referred to as the Lewes–East Grinstead report. Most of the calculations were made in 1953 for a previous hearing, but were not fundamentally changed for the 1957 inquiry.

[3] The cost of locomotive repairs is another example. The regional average used in the Lewes–East Grinstead case is stated on p. 19 of the report of the inquiry, and described on pp. 12–13 of the *Minutes of Proceedings, First Day*. The Traffic Costing Service now measures the costs each month of individual motive-power depots, and so again an average for a smaller entity is now available.

by withdrawal of the service there are usually fewer allocation problems, since joint costs which are unaltered by the withdrawal do not enter into the calculations. For example, if a locomotive is used both on the service to be withdrawn and on other services, then to calculate avoidable costs, an allocation of direct maintenance costs will be required; on the other hand, if the costs of supervision at the motive-power depot will remain unaltered, then an allocation of these overhead costs is not required.

Both British Railways and the C.T.C.C. agree that avoidable cost, and not total cost, is the relevant concept.[1] Until the agreed scheme came into operation, however, the time period upon which the avoidable cost should be based had been subject to dispute. In 1951 the B.T.C. records that the term cost " as used in context with the traffic costings carried out by the Commission " means " the actual expenditures incurred, or to be incurred, by the Commission *in the long run* to maintain and operate the apparatus required for a given level of services and traffic." [2] Thus, in keeping with this approach, the cost calculations presented at the Lewes–East Grinstead inquiry included renewal charges for all the capital assets involved, even though some of these had many years of useful life still to come, and hence would not have needed replacement until many years after the inquiry. The C.T.C.C. were very critical of this approach,[3] taking particular objection to the calculation of renewal and interest charges. These were dismissed as purely notional and the Committee argued that the Commission should base its case solely on " direct factual savings," *i.e.*, day-to-day expenses which would be saved immediately the line was closed. Thus while the Commission had taken a very long-term view, the Committee went to the other extreme and looked only at very short-run costs.

For non-specific assets, the railway accountants had used a straight-line depreciation method based on replacement cost, and this method has been carried over into the agreed scheme. But for specific assets there was considerable difference of opinion: the Committee objected to certain features of the sinking-fund method which had been used. In particular, the Committee could not accept that the annual payment into the sinking-fund was a cost which could be avoided by closing the line, its objections being based on several grounds:

(1) Though the method was consistent with British Railways' long-run approach, the Committee, from its short-run point of view, did not want to see included charges for renewals that would not be undertaken in the immediate future.

[1] As with all opportunity cost rules, the agreed scheme thus allows, in theory, the withdrawal of a " profitable " service, *i.e.*, a service where the *total* costs ascribable to the service are less than the revenue associated with the service; on the other hand, popular usage refers to the withdrawal of unprofitable or unremunerative services; in practice, it seems unlikely that the withdrawal of a profitable service would be considered.

[2] British Transport Commission, *Annual Report for 1951*, p. 71.

[3] Lewes–East Grinstead Report, *op. cit.*, paras. 24–30 (our italics).

(2) The Committee criticised the patently careless way in which the technical lives of some of the assets had been calculated; in the case of many assets still in use the expired life to date was greater than the estimated life used in the sinking-fund calculations, but no adjustment had been made to the renewal charges.

(3) There was in fact no sinking fund, because the financial difficulties of the Commission prevented the establishment of such a fund; instead the Commission charge renewals to revenue, as and when they occur. The Committee could not accept a notional payment into a notional fund.[1]

The agreed scheme is a compromise from the point of view of the time period considered; briefly, the cost saving to be taken into account is the opportunity cost relative to the next five years[2]—that is to say, the annual cost is defined as one-fifth of the actual expenditure which British Railways would expect to incur during the next five years' working of the line, including renewal expenditure on such specific assets as would actually need to be replaced during that period.

The related problem of charging interest on capital assets caused considerable confusion at the Lewes–East Grinstead inquiry largely because of disputes over accounting technicalities. The economic argument is that, according to the opportunity cost criterion, the interest charges on new capital expenditure (including renewal of assets) must be regarded as an avoidable cost; since the railway accountants were taking a very long-run view, it was legitimate to include interest charges on *all* the capital assets. It seems likely that this view was the basis of the arguments presented at the inquiry, but these were put forward in an obscure and inconsistent manner, and it was not made clear that the inclusion of interest charges and the use of the sinking-fund method were separate issues. The Committee was unable to separate the two issues, and in rejecting the use of the sinking-fund method it also entirely rejected the inclusion of any interest charges.[3] As a consequence, interest charges are not allowed in the agreed scheme.

IV. Criticism of the Agreed Scheme

As is immediately clear, the agreed scheme diverges from the opportunity cost criterion by its exclusion of interest charges on such new capital expenditure as is incurred during the time period considered.[4]

[1] Until the Committee voiced its criticisms the railway accountants were intending to use, in the future, the notional sinking-fund method for *all* capital assets; see *Minutes of Proceedings, Second Day*, p. 71.

[2] The scheme speaks of "a short period of years, normally five years," but in practice, the period considered seems invariably to be five years. This point is of considerable importance and is discussed below in detail.

[3] The arguments for and against the sinking fund and the inclusion of interest charges appear at length in the *Minutes of Proceedings, First Day*, pp. 14–18, 46–7, *Second Day*, pp. 4–12, 17–19, 29, 45–8, 54–7, 71–4.

[4] But it may be noted that for internal purposes British Railways continues to include interest among avoidable costs.

A second criticism concerns the treatment of renewal charges for specific assets. The St. Ives–Kettering case is used to illustrate the point. The booklet [1] issued to those who proposed to lodge objections at the inquiry held on April 14, 1959, by the East Anglian Transport Users' Consultative Committee included the table of estimated savings as laid down in the form of presentation of the agreed scheme; this is reproduced below:

TABLE II

Estimated Savings from Withdrawal of Services, St. Ives–Kettering Line

	Per annum, £.
(*A*) Immediate and short-term savings of working expenses (Savings in rolling-stock repairs have not been included)	33,000
(*B*) Provisions for renewal saved (Provisions for rolling-stock and plant have not been included)	57,400
Deduct	
(*C*) Estimated loss of gross receipts	13,900
(*D*) Estimated cost of providing alternative road services (cartage)	100
(*E*) Net estimated savings from closing: $(A + B) - (C + D)$	76,400

At the inquiry the deputy chairman of the Committee told an objector that of the annual saving of £57,400 on provision for renewals, £32,000 was the annual portion of £160,000 which would be required for the renewal of some bridges if the line were kept open for another five years.[2] Thus a specific asset, in this case a bridge with a technical life of perhaps 100 years, must be written off in five years, by virtue of the treatment prescribed in the agreed scheme. The fallacy in the analysis lies in the application of the opportunity-cost criterion to an unnecessarily restricted range of options. The appropriate question to ask is not whether the line will cover its avoidable costs if run for the next five years, but rather: "Is there any period of time for which the avoidable costs over the whole of that period can be covered by the estimated extra revenue?" If one or more such periods can be found, then the criterion would then dictate that the line should be kept open.

The general point may be illustrated by means of Fig. 1, which describes a hypothetical example having some of the characteristics of the St. Ives–Kettering case.

Time (in years elapsed from the present moment) is plotted along the horizontal axis, and discounted cumulative costs and receipts along the ordinate. The cost curve is based upon engineers' forecasts of how much expenditure would be necessary in each of the next n years if the line is to be operated in a given way.[3] Each year's expenditure is discounted to the

[1] British Railways (E.R.), *Proposed Withdrawal of Train Services between St. Ives and Kettering* (February 1959).

[2] *Hunts Post* (Huntingdon), April 16, 1959, p. 13.

[3] This rule is modified in one respect: for non-specific assets the sum to be included in the total of avoidable costs is the relevant fraction of replacement costs, in accordance with the straight-line depreciation method mentioned previously.

present, and cumulative sums for the first year, the first two years taken together and so on are then prepared. Estimated extra receipts are similarly analysed. The graph then represents the present values of opportunity cost and receipts for each of these future time spans. In drawing Fig. 1, a constant rate of revenue has been assumed, whereas the cost curve assumes a fairly steady rate of expenditure except for a large " lump " of investment about year *x* corresponding to the renewal of bridges

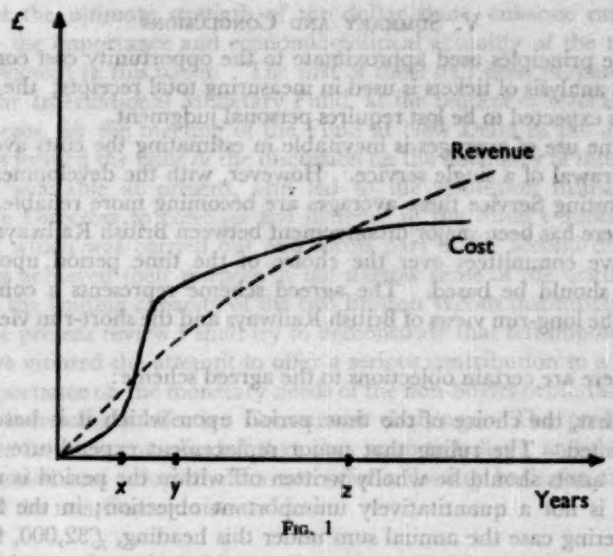

FIG. 1

in the St. Ives–Kettering case. The five-year period usually considered in the agreed scheme corresponds in the graph to a period such as the first *y* years, where a substantial lump of investment has been undertaken just before the end of the period. Running the line for exactly that period is unprofitable (*i.e.*, cumulative costs exceed cumulative revenue), *but* as the graph shows, there are other periods for which the line could be run profitably: either for a period of less than *x* years, in which case the lump of investment is not undertaken (the bridges are not renewed), or for a period of more than *z* years, in which case the investment is undertaken but is used for a fairly long period. This is no more than a formalisation of common sense: the business-man controlling a not very profitable business does not usually undertake major investment in non-transferable plant unless he expects to use the plant for a major part of its technical life.

Finally, the agreed scheme is restrictive in that each service is considered *separately*. The opportunity cost criterion is used only to measure the change in net revenue on closing one service where the comparison is only with the

status quo. But in areas with several unremunerative lines and some degree of duplication of services the interdependence of revenue should be recognised. A fuller opportunity cost analysis would seek to find out, for example, which of lines A and B should be closed in order to give the greater improvement in net revenue, on the assumption that at least one line should be kept open. Some clause requiring maximisation of net revenue would be necessary to guide the decision in such a case.

V. Summary and Conclusions

1. The principles used approximate to the opportunity cost concept.

2. An analysis of tickets is used in measuring total receipts; the estimate of receipts expected to be lost requires personal judgment.

3. Some use of averages is inevitable in estimating the costs avoided by the withdrawal of a single service. However, with the development of the Traffic Costing Service these averages are becoming more reliable.

4. There has been major disagreement between British Railways and the consultative committees over the choice of the time period upon which estimates should be based. The agreed scheme represents a compromise between the long-run views of British Railways and the short-run views of the C.T.C.C.

5. There are certain objections to the agreed scheme:

First, the choice of the time period upon which it is based is too restricted. The ruling that major replacement expenditure on long-lived assets should be wholly written off within the period is unsound. This is not a quantitatively unimportant objection; in the St. Ives–Kettering case the annual sum under this heading, £32,000, formed a large proportion of the estimated annual savings from withdrawal. A more satisfactory method of treating renewals is suggested.

Secondly, interest on new capital expenditure is excluded.

Thirdly, the interdependence between withdrawal proposals is not recognised.

6. Because so many of the services withdrawn have been very unremunerative, it does not necessarily follow from these objections that any mistaken decisions have been taken.

7. This paper has concentrated upon economic factors. It is recognised that in considering withdrawal proposals both British Railways and the consultative committees have also to take into account wider questions of social policy.

M. Howe
G. Mills

University of Sheffield.

INTERNATIONAL RESERVES AND LIQUIDITY[1]

I. Introductory

The abrupt return to "non-resident convertibility"[2] by most Western European countries at the turn of 1958/59, and the doubts which have crept up about the ultimate strength of the dollar since, enhance rather than diminish the importance and economic-political actuality of the two documents reviewed in this paper. The first of these had been prepared by the staff of the International Monetary Fund, at the request of several member governments, for the meeting of the Fund at New Delhi in the autumn of 1958. It formed the basis of the discussion on the adequacy of international liquidity available at present, and led to the resolution instructing the Executive Directors to consider the increase in the Fund's quotas, an instruction which was carried out and forms part of the second document.[3] Both thus achieved their purpose in the narrow sense of the word—the increase in the lending capacity of the two Bretton Woods institutions.

In the present review I shall try to demonstrate that self-imposed limitations have vitiated the attempt to offer a serious contribution to a debate of great importance on the monetary needs of the non-Soviet orbit, faced as it is with an increasingly effective Communist challenge. The problems discussed are far more complicated than they seem to believe, and the solution recommended and adopted does not offer a lasting basis for the steady growth of the non-Communist world.

II. Back to the Quantity Theory

The Staff Report of the I.M.F. does not provide a solid theoretical foundation for an evaluation of policy for international reserves. It is based on the double axiom that the supply of money has a direct and simple relationship to business activity and the balance of payments, and that reserves have a similar role in determining money supply. The following *obiter dictum* (p. 68) is typical:

> "The link between the amount of reserves and the amount of domestic money has been weakened in all countries that have not made a stable fixed rate of exchange an overriding objective of monetary

[1] *International Reserves and Liquidity.* A Study by the Staff of the International Monetary Fund. Washington, D.C., 1958. *Proposals for increasing the Resources of the International Monetary Fund and the International Bank for Reconstruction and Development.* Cmnd. 652, London, February 1959.

[2] In some countries, of which Germany is perhaps the most important, the degree of convertibility was greater. *De facto* all controls over the export of capital have been abandoned.

[3] The second part concerns the increase in the borrowing powers of the International Bank simultaneously proposed and agreed upon.

policy. *An increase in the supply of domestic money may not lead to a loss of reserves if the exchange rate is allowed to depreciate*" (my italics).

This implies that international reserves and their maintenance are not merely ends in themselves but are also something which could by themselves (without some conscious policy decision involving outlay) have a direct and immediate influence on economic activity—"increased reserves failed to stimulate trade" (p. 25). "It is indeed questionable in retrospect whether any amount of reserves would have been large enough" (in 1931) to "stave off the troubles in the existing exchange structure" (p. 23).

The Keynesian analysis, which showed clearly that it is *outlay* and *not its monetary image* that matters, has been completely thrown overboard. Even odder seems the treatment of capital movements. It is implied that the need for reserves will depend on the "degree of efficiency of the prevailing international credit system" (p. 9), and "day-to-day disturbances, and even seasonal movements, of international payments need make no great demands upon reserves when credits of various kinds can be arranged."

No doubt international capital movements and a well-working international credit system might, in certain circumstances, help to bridge gaps between imports and exports. But it is illegitimate to imply (pp. 2, 3, 6, 10) that the movements of international short- and long-term capital are necessarily of a "balancing" character.[1]

The vital question is totally neglected, whether the need for reserves is determined not merely by the *size of foreign trade* (or rather international payments) but also by its *instability*.[2] The question is not discussed whether such instability could be dealt with more quickly and at less cost in terms of income foregone, by policies which embrace not merely "the realism of the existing pattern of exchange rates" and "the appropriateness of domestic and monetary fiscal policies" (p. 9), but the whole armoury of counter-measures, including quotas which have been tried with great success in countries such as Australia.

Few people who had lived through the last international liquidity crisis of 1929–34 will recognise their memories of those past events in the interpretation of history offered in this document (p. 23). It is not astonishing, therefore, that the analysis of the current situation is somewhat less than balanced. It is flatly asserted that the increase in the granting of private international credits (p. 27) has decreased the risk of foreign exchange "tensions." The fact that the public sector has grown since before the War seems to be regarded as a *destabilising* factor, as it often makes countries' economies "less flexible" (p. 28). One would have thought that the growth of the

[1] The Radcliffe Committee has accepted the view (§ 727), though they also admit that in an open system restrictive measures must become necessary to restore confidence in the currency (§§ 402 and 436).

[2] This is also true of Professor Triffin's essay, however welcome his support for increased liquidity. Review of the Banca Nazionale del Lavoro 1959.

public sector (and welfare transfer payments), especially in America, and the consequent strength of the built-in stabilisers of budget surpluses and deficits, had made the monetary system safer, far more flexible and therefore had stabilised the economies. The fact that the 1953–54 and, again, the 1957–58 United States recession was rather quickly reversed and did not result in vast export surpluses is demonstrably connected with this development. Surely the Fund cannot prefer a greater flexibility—downwards.

Accordingly, a somewhat narrow view is taken of the functions of the Fund. "The financial assistance of the Fund is of course a short-term character, mainly intended to bridge the gap while the countries *themselves* [my italics] take whatever measures may be necessary to restore equilibrium." Not a word is said about the assistance of the Fund being required for so long as a major creditor country suffers a deflationary bout. The implication is that the assistance must be used to give time to the *debtor* country to take restrictive measures and cut back ambitious development programmes, irrespective of what the *depressed creditor* may be doing in his turn. This must give a deflationary bias to the world economy.

So long as the United States were continuously fully employed there might have been some excuse for refusing to create additional international liquidity out of thin air, on the argument that it might merely fan the inflationary excess in the United States. But was there any justification for this policy in 1957–58? Are poor countries to cut their development expenditure because there is a recession in the United States or the United Kingdom? Will that not aggravate the recession in the fully developed areas? Will that further fall not create a cry for more "flexibility"? Where is this cumulative process to end? One wonders why, for instance, nothing is said of the so-called scarce currency clause, which was to have been the great safeguard against persistent creditors by enforcing reasonable creditor policies, and on the basis of which such eminent economists as Keynes and Harrod recommended the acceptance of the Bretton Woods Final Act.[1]

The document is not clear on this point:

> "There is now greater understanding of the conditions necessary for an improvement in the reserve position. For example, a recent statement by the Monetary Committee of the International Chamber of Commerce recommended that countries gradually reduce their debts to central banks, and thus strengthen not only their internal conditions but also their reserve holdings." [2]

A combined deflationary action on the lines suggested by all countries would obviously not merely fail to strengthen anybody's "internal condition" but would also lead to severe unemployment. If the process is ruthlessly pursued

[1] Significantly the Radcliffe Report completely repudiates these romantic claims (§ 690).

[2] Semantic philosophers might be tempted to use this passage as an examination question, asking how many tacit and inconsistent assumptions lurk in the latter part of the second sentence.

by *all*, even their foreign reserves cannot increase. The deflationary policy of any single country will, oligopolistically, be matched by countervailing efforts at deflation of others, all descending in a spiral without any change in their reserves.

The tantalising problem whether high investment and faster development might not in the longer run enable a balancing of international payments of weaker countries without import cuts, and on the basis of a steadily increasing standard of life, is not even considered.

This attitude necessarily aggravates the deflationary bias inherent in the Bretton Woods arrangements, and it is only slightly mitigated by the existence and activity of the Bank. The latter has certainly performed an important task in easing the flow of funds towards underdeveloped areas. But two factors stand out, both sobering to optimism. The rate of lending, while increasing, has yet to reach the rate of $1 billion per annum. It remains less than 1% of world imports. The worsening of the terms of trade of primary producers by 2½% would wipe out the effect of this lending.[1] In actual fact these terms moved 7–8% against the primary producers between 1957 and 1958.[2] Thus the sort of policy advocated by the spokesmen of the International Monetary Fund is likely to harm the poorer countries more than any aid that is or can at the moment be contemplated.

Perhaps the most important conclusion of the Staff Report is the continuous fall[3] recorded since 1948 in the rate of expansion of both international trade[4] and manufacturing production.[5] The Report complacently states:

> " Past experience seems to show that periods of very rapid expansion are generally followed by periods of more moderate growth. It is of course impossible to forecast what the rate of growth will be in the years immediately ahead, but it would probably not be over-optimistic to retain the conventional ' normal ' annual rate of about 3 per cent for the growth of world trade."

Considering that the latter rate is less than half that achieved in the period 1948–56, when the reconstruction of war-damage in large parts of the non-Soviet world had far advanced, this view is indeed not " over-optimistic." It is less than a half, probably nearer a third, of the rate achieved by the

[1] Cf. National Institute of Economic and Social Research, *Economic Review*, No. 1, January 1959, p. 15.

[2] This has at last been pointed out by the U.N. World Economic Survey for 1958, especially pp. 3–11. In the previous year the U.N. still seemed to be worried by world inflation.

[3] Table 17, p. 70.

[4] From 7·5% per annum in 1948–1956 to 5·4% between 1951 and 1957. Since 1957 world trade has fallen about 10% (International Financial Statistics, I.M.F., August 1959, pp. 22–3).

[5] From 6·1% per annum in 1948–56 to 5% in 1951–57. Between 1957 and 1958 world industrial production fell 3%, and even in the first quarter of 1959, despite the American recovery, stood only fractionally higher than in 1957 (*Monthly Bulletin of Statistics*, U.N., August 1959, Special Table A, p. viii).

Soviet bloc, according to United States intelligence reports. Inasmuch as " past experience " is based on the absence of any coherent attempt to control cyclical fluctuations, this estimate of the future implies a dismal reflection by the staff of I.M.F. on the skill which is likely to be evinced in the management of the international economic destinies of the non-Soviet orbit.

The Report fails to discuss these further implications of its own analysis in terms of loss of growth of output or equality. The implication is that monetary policy not merely works but works with great ease and subtlety—and achieves as good results as can be expected. The book-keeping identity between the foreign balance and the difference between domestic output and national expenditure is (as seems to be the fashion these days) used in a schedule-sense to demonstrate that cuts in home outlay, through monetary policy alone, will optimally and smoothly readjust the balance of payments.[1]

The Report seems to show conclusively that most governments and central banks " tried to achieve ratios " between imports and reserves " in the sense that if reserves rose beyond some such level, they saw fit to adopt a more expansionist policy " (p. 48). They do not seem to realise that this demands arrangements for a continuous supplementation of the increase in international liquidity if this (depending mainly on the increase in monetary gold) falls short of the desired rate of expansion of production and trade. But there is no discussion of such policy aims and, after a lengthy statistical exercise, which aims at showing that the rate of increase in monetary reserves need not be as high as that of the (rather modest) estimate of economic growth of the free world, the Report comes to the conclusion:[2] " It is doubtful whether, in the circumstances of the world today, with world trade greatly expanded in volume and value, the Fund's resources are sufficient to enable it fully to perform its duties under the Articles of Agreement." On this basis the Executive Directors recommended a 50% increase in quotas.[3] This was accepted and carried out.

III. An Economic Theory of Reserve Holding

Judgment on the adequacy of international reserves will depend on the aims of economic policy and the role which these reserves can play in the execution of that policy in relation to other means of policy.

(*a*) The policy followed by the (dominant) members of an open system, their willingness and ability to limit surpluses and deficits on international payments, the rapidity with which single countries can, under the prevalent rules of the game, legitimately take steps directly to limit the consequences of a loss of balance, these are some of the factors which will decide on the adequacy of monetary reserves. *The need for liquidity is a combined function*

[1] Cf. Sir Robert Hall (Economic Journal, December 1959, p. 651).
[2] *Ibid.*, p. 99.
[3] *Ibid.*, p. 16.

of the size of likely balances, i.e., *of the volume of international payments and the magnitude and duration of their instability. Fundamentally this is determined by the policy framework* (*in particular the range of "admissible" means of readjustment*) *and the ends of policy*, especially how much unemployment and slowing down of growth countries will tolerate.

(*b*) It should be noted, moreover, that a very large proportion of total trade and payments is concentrated into a few major powers. The number of these effectively independent units is further reduced by groupings (often regional and sometimes—as was the case with the Sterling Area until convertibility was introduced—backed by explicit institutional arrangements) based from this point of view on a key-banking centre and key-currency.[1] The more complementary the regional grouping, the freer it is in its choice of policy or the less intent to achieve certain policy aims not shared by the rest of the world, the smaller its need for reserves. Shared policy goals, whatever their nature, whether avoidance of unemployment or of gold losses, will in any case reduce this need for the world as a whole. Thus the assumption of the Staff Report that the following of "sound" policies all round reduces the need for reserves is accurate. It amounts to the basic assumption that countries will not attempt to maintain employment if some powerful ones refuse to do so.

If, on the other hand, full employment is a universally declared policy, and Governments are able and willing to intervene promptly in case of a deflationary or inflationary shock by all appropriate means, including controls and fiscal policy, the minimum safe levels of reserves will be far smaller than in a system in which prolonged unemployment is tolerated (or even induced, in order to ensure price stability) in dominant countries while others try to avoid competitive deflationary policies. A system which freely permits capital movements, even if they are of a speculative nature, will, under modern conditions, require far higher reserves than a system where speculative capital movements are severely discouraged.[2] It is the volume of *payments* and its instability, and not merely that of *visible trade*, which is the rational determinant of reserve requirements.

The relationship of the member countries of the world economy to one another is therefore one of oligopoly. Countries will trim their behaviour to one another. The discouraging feature of this relationship is that, so long as

[1] Economically the United States itself is a regional (rather than national) unit, whose high complementarity, which automatically reduces dependence on foreign supplies, is further backed by tariff and quota regulation.

[2] This has been accepted by the Bretton Woods Conference which (Art. VI. Sec. 2/3) prohibited the use of borrowing power at the Fund to sustain capital exports. The I.M.F. seems to regard all capital movements as "balancing" and does not discuss the need to encourage the application of its own charter. The spirit of the charter contrasts sharply with the attitude of the Bank of England as characterised by one of its ex-Directors, Mr. Siepman (letter to *The Times*, August 31, 1959). This regards control of capital movements as "futile and mischievous" or worse. The Radcliffe Committee (par. 728) is sceptical of the effectiveness of control, but did not discuss this (possibly dominant) reason for its failure in Britain. It nevertheless advocates its retention.

international reserves are scarce, behaviour which will induce gains of gold will be at a premium, because severe losses of gold must induce others to follow suit in such policies (the recent behaviour of European countries when the United States was embarrassed by gold losses is an excellent example). Thus scarcity of reserves is likely to aggravate itself; and uncertainty about strong countries' monetary strategy would have the same result. Safety first would counsel deflation.

There is a further reason why it is only too likely that the system will have a bias against full growth and employment and in favour of avoiding gold losses at whatever cost in terms of expansion. Under modern conditions [1] adherence to the "classic" rules which demand symmetrical expansion as well as contraction might seem incompatible with domestic stability, especially price stability.[2] If the problem of domestic inflation cannot be solved by policies not impinging on the balance of payments (by their employment effects), a balanced functioning of the world payments system will not prove possible. Any increase in reserves will then represent a deflationary impact abroad because it originates in a cut in demand.[3]

(*c*) The acquisition of international reserves by any one country as a result of export surpluses or borrowing represents a real sacrifice in terms of forgoing investment (or for that matter consumption). This sacrifice can be justified by using them to pay for imports only if it enables the holder to increase over time the growth of its economic activity and investment, despite disturbances in its balance of international payments, in comparison to the level which would have been possible without such reserves. Inasmuch as the initial level of investment would be higher if export surpluses were not used to accumulate reserves, this means that the reserves enable the avoiding of a more than proportional toll over time as a result of these disturbances and the restrictions which they make inevitable. These disturbances can originate either abroad, *i.e.*, a fall in the demand for exports (or a flight of capital), or internally, *e.g.*, through crop failures. "Free" reserves are therefore one of the means by which the necessity of interrupting the growth of the economy might be obviated and optimum growth over time might be secured.[4] Only by fulfilling this role can the sacrifice incurred by keeping resources uninvested be justified. It should be noted that the use of reserves is a once for all gain. Only if the consequential increase in

[1] This was the case already in the 1920s. When Mr. Montagu Norman persuaded Governor Strong in 1927 (Sir H. Clay, *Lord Norman* (London, 1957), p. 237) to lower the discount rate in order to ease London's difficulties the drift towards the stock market crash of 1929 started.

[2] Cf. *Oxford Economic Papers*, June 1958.

[3] This is especially true if one of the international banking centres whose liabilities constitute the reserve of other countries were to start trying to "increase its liquidity" by "repaying liabilities." The thoughtless advocacy of increased liquidity for London has been one of the danger points in the last recession. The warning of the Radcliffe Committee (par. 663) against thoughtless forcing of repayments is welcome.

[4] An alternative would be to hold reserve productive capacity or stocks of commodities.

national income results in an increase in investment would it have continuing beneficial effects.

The forgoing of the increase in the level of investment implied in a cumulative increase in the reserves reduces the potential maximum rate of growth. If an increase of the rate of growth enhances the possibility of accelerating the increase of income without imperilling the balance of payments (and enables the country, eventually, to acquire reserves without slowing down growth) the accumulation of reserves is not justified. It should be noted that policy measures (*e.g.*, exchange or import control) which obviate cuts in investment in case of balance-of-payments difficulties would reduce the rational need for reserves.

Borrowing could be the other alternative. The choice between borrowing and reserve holding will depend on the terms at which the former can be procured [1] in comparison to the loss of real income due to the holding of reserves (which might themselves yield some income).

We might conclude:

(i) The poorer the country, the smaller its capital supply, the greater probably the real sacrifice implied in the holding of reserves in terms of the potential income forgone.

(ii) This sacrifice by poorer countries might be reduced by keeping their reserves in freely marketable, income-earning assets,[2] though the maximum rate of income earned in this way must be well below the increase in domestic output and income forgone.

(iii) Poor countries will probably have greater need for holding reserves than richer ones, and this for two reasons. On the one hand, the instability of primary products markets and of harvests is notorious, and they mostly depend on a few products of this type, which increases their risk. On the other hand, their capacity to obtain credits on reasonable terms is much less than that of richer countries, unless purposive international institutional arrangements are made.

(iv) The limitations on the choice of policy (*e.g.*, the prohibition of direct controls over imports and exports) imposes disproportionate burdens on poor countries. Their acceptance of such burdens is rational only if international arrangements are made to offset this burden by special grants or credit arrangements.

None of these points have been considered by the Staff Report.

[1] Thus on the character of international financial organisations.

[2] This is the justification, from the "lending," colonial, territories' point of view, of the British colonial currency and banking system. Unfortunately the investment policy of the Crown Agents for the Colonies (latterly for Overseas Territories) was so unthinkingly mechanical that the dear money caused considerable capital losses to these relatively poor territories. The emotional reaction to this admitted mismanagement might well be a liquidation of the sterling reserve system (the number of new "Commonwealth countries" accumulating gold reserves is steadily increasing). This, as we shall see, inevitably imposes a strain on the world reserve situation.

(*d*) If reserves are kept in assets of another country total international liquidity is increased, as the accumulation of gold exchange is the alternative of acquiring gold. This introduces a further complication because the acquisition of these assets (instead of gold) has a (relatively) inflationary impact, their repayment a deflationary impact. If the former happened in a situation of all-round full employment, and if the financial centre disregarded in its policy making the increase of its liabilities, the process might facilitate general inflation. This danger has been much emphasised. Less attention was paid to post-war [1] waves of liquidation of gold exchange reserves. This happened at almost regular two-yearly intervals in the case of Britain, and contributed much to the severity of the balance-of-payments crises which caused interruptions of expansion in this country. There has also been at times some liquidation of dollar balances.[2] If this process were to gather momentum it might well result in a general deflationary pressure.[3]

(*e*) An overall shortage of liquidity will make itself felt by simultaneous pressures on the reserve position of a number of countries while no major country deems it advisable to permit the loss of gold reserves in accordance with the " classic " rules of the gold standard.[4]

This might force deflation on a number of others to prevent their losing gold. An oligopolistic struggle might arise: attempts at increasing reserves would cancel each other. The reserve position of individual countries would not improve. But the general deflationary pressures would leave all worse off in terms of increased unemployment and fallen national incomes. The costless provision of *additional* reserves, *e.g.*, by increases in the price of gold or the creation of additional internationally accepted means of payment, would then be the proper response, which should be contrasted with efforts of single countries to raise their reserves by attempts at redistributing *existing* reserves. On the other hand, no amount of additional reserve can be " sufficient " if the losing countries continue policies which lead to deficits in the balance of payments.

(*f*) If the rate of increase in international liquidity permits the achievement of full employment any further increase of reserves must be sterilised to avoid inflation. At this point some rules of discipline will have to be evolved stabilising the rate of investment and consumption in the poorer

[1] And of course in the period after 1929. Indeed, the severity of that depression can, to a considerable extent, be explained by the financial crisis which began in 1931 and finally disrupted even the United States banking system and currency.

[2] Since 1956 the more rapid expansion of *exchange* as contrasted with *gold* reserves has come to an end. Total world gold reserves have increased by almost $2 billion between 1956 and 1959, and the gold reserves outside the United States at the end of 1956 by almost $3½ billion. Official foreign-exchange holdings, however, have been slightly drawn down from $17·015 to $16·540 billion at the end of 1957. This was mainly due to a liquidation of sterling liabilities, but balances in America have also been reduced by almost $300 million.

[3] Cf. the United States Secretary of the Treasury's declaration to the 1959 meeting of the Governors of the Bretton Woods institutions as reported in *The Economist*, October 3, 1959, p. 63.

[4] This is exemplified by the perverse reaction in Europe to United States gold losses. Cf. below.

areas of the world. Inasmuch as these areas will have to rely more and more on stand-by credits for meeting exceptional strains (having used their low-yielding assets to speed up development), it should not be impossible to maintain such discipline.

(*g*) The holding of "own" reserves (in contrast to stand-by credits) might be confined to richer countries. Their redistribution between "richer countries" through international lending operations, and from poorer to richer countries through permission to use reserves for an increase in investment, might be used to speed up development in poor areas and concentrate burdensome reserves in the hands of rich and, possibly, of middle-class countries, which can afford them. Thus an international co-operative reform of reserve policy would have contributed to the equalisation of the rate of investment and growth,[1] while minimising the overall need for reserve-holding.

IV. The Elements of a Solution

A satisfactory solution of the problem of international reserves must, in my opinion, be able to provide the basis of stable and rapid growth in the non-Soviet orbit. It must purposefully eliminate purely financial obstacles in the way of continued growth.

It should be noted that such a solution is intimately bound up with the diagnosis of the cause of inflation. No Government will, or can afford to, tolerate the emergence of a strong upward trend in prices. This is still automatically identified with the existence of excess demand. It follows that inflation is fought mainly, if not exclusively, by restrictive monetary policies. The experience of the 1957/58 recession, when the rise in manufactured prices continued despite large unemployment, has been completely disregarded. This failure of diagnosis has made rational and balanced international economic policy impossible in the non-Soviet orbit. Large and persistent creditor countries (such as Germany) may well refuse to use the increase in their reserves because of the fear of aggravating the international rise in prices. Thus deficit countries must redouble their effort at restriction. The oligopolistic game described in the previous section will then become unavoidable. Good international behaviour demands that the problem of securing stable prices—a perfectly legitimate and politically vital policy goal—should be secured without increasing the unbalance in international payments through one-sided deflationary action. A rational solution should therefore include:

(i) a mechanism by which internationally acceptable means of payments (*i.e.*, liquidity) can be created, when necessary, sufficient to

[1] These problems were treated exhaustively in two publications of the Oxford University Institute of Statistics: *New Plans for International Trade* (M. Kalecki, E. F. Schumacher and T. Balogh, Oxford, 1943) and *The Economics of Full Employment* (F. A. Burchardt and others, Oxford, 1944).

obviate the contingency of a general deflationary pressure merely on account of their scarcity relative to the demand of monetary authorities; while the emergence of such a shortage is not yet a proven fact, the conjuncture of American fears of further gold losses, at a time when they are far from fully employed, with a situation in which no other country feels sufficiently comfortable to expand vigorously, suggests that the time might not be too distant when such shortage will be obvious;

(ii) rules by which the need for such additional international liquidity could be minimised, or at least kept within limits; the creation of vast amounts of cash (*e.g.*, to counteract a persistent deflationary pressure) itself might result in a loss of confidence and painful attempts to liquidate the system.

I shall deal with these two aspects of the problem one by one, though the acuteness of the first problem will be determined by the success with which the second is tackled. As we have seen, the problem of liquidity is a question partly of the relation of "stocks" (international reserves) to "flows" (the balances arising out of international payments) which will be determined by policy and partly (but in some sense more acutely) by the consistency of the "stock" itself. It might be as well to get this latter problem out of the way.

(a) *The Effectiveness of Reserves*

The Geneva Conference in 1922 advocated: (i) the restriction of the circulation of gold; (ii) the use of the gold exchange standard; and (iii) a redistribution of gold reserves; these were to be the main ways in which the "effectiveness" of insufficient gold reserves (so to speak their velocity of circulation) could be increased.

(i) The hoarding of gold has been increasing since the War, and so has the industrial demand. While the French stabilisation and the return to "normality" in Europe might reduce the former, this is not a factor which ought to be regarded too optimistically. It is not likely that the addition to the monetary gold stock will be at a rate higher than $700 million per annum. This is equivalent to less than 1½% of total world reserves (including foreign exchange) and about 2% of gold reserves.[1] This rate is rather low, especially if (as seems likely) policy trend towards greater "liberalisation" continues. The latter trend inevitably results in larger potential

[1] The argument that it represents a much larger portion of gold reserves outside the United States (about 3% as at the beginning of 1959) does not mean much. The reaction of the United States Government to recent gold losses shows that the point at which defensive action is going to be taken has been reached. The "free gold" (*i.e.*, gold available for balance-of-payments purposes and not absorbed by reserve requirements accommodated only $8·2 billion out of a total of $20·6 billion reserve at the end of 1958). The free gold was just over $8 billion. The short-term liabilities of the United States amounted to $14·6 billion and foreign portfolio investment in the United States (which are liable to liquidation in bull markets) to $9 billion. Of the short-term debt $8·7 billion represented the holdings of foreign governments and central banks. Thus the possibility of embarrassment is not inconsiderable unless international co-operation is forthcoming.

balances, *i.e.*, increased need for reserves because of the rather slow effectiveness of monetary measures (as against direct controls) in readjusting trade and payments; and the likelihood of increasingly acute speculative capital movements.

(ii) The transfer of gold reserves from the United States to the " middle-income-class " countries (mainly Europe) has increased the " effectiveness " of gold-holding. In these countries " free gold " is a larger portion of the total reserve. But (as seems certain) [1] this process of redistributing world reserves has exhausted the limit of comfort and tolerance of losses in the United States. Thus, no further gains can be expected from this source.

(iii) The trend in gold-exchange holdings has shown marked instability since 1956. Between the end of 1957 and June 1958 almost $0·7 billion liabilities were liquidated. Most of this was due to the penury in primary producing countries; there is no evidence of liquidation of balances due to nervousness about the dollar.[2] A number of central banks, however, might have decided as a matter of policy to hold a larger portion of their reserves in gold. Sterling liabilities have been at times (*i.e.*, 1957) under violent pressures. Their recent recovery need not be more stable than in 1950.

It would be foolish to think that an increase in gold exchange balances will contribute significantly to the problem of international reserves. Both in the case of England and in the case of America the very accumulation of exchange reserves by other countries has been regarded as a growing national weakness instead of being viewed as a vital contribution to maintaining the liquidity of the world economy as a whole. Indeed, it is all but certain that more formal arrangements would be needed if the fact that international liquidity is provided by liabilities of the United States or the United Kingdom is to be prevented from increasing instability. The liquidation of gold exchange reserves, as at the end of the 1920s, took place at the most awkward moment from the point of view of the domestic monetary policy of the " banking centres " and led to the prolongation and aggravation of the depression.

To obviate any repetition, rules for good neighbourly conduct between treasuries and central banks should be worked out. This might take the form of an agreement between the members of I.M.F. not to demand the conversion of existing foreign-exchange balances into either gold or other currencies (*e.g.*, from sterling to dollars) unless it is needed for payment of genuine current transactions and non-speculative lending operations. Countries which have no exchange control even on capital movements would have to pledge themselves to discourage such transfers between the currencies of member countries, and at any rate refrain themselves from such transactions in respect to their own holdings. There is acute prejudice

[1] See above.

[2] Unofficial holdings rose. So much for the claim that foreigners need be " reassured " by deflationary measures of the U.S. dollar!

against such undertaking for fear of "exchange losses." But such losses are unlikely unless a large-scale conversion of foreign-exchange liabilities is attempted. A gold clause might obviate unjustified fears, and thus prevent its having to be implemented.

On the whole, the elaboration and acceptance of such rules of good-neighbourly conduct seems (at any rate in the short run) more conducive to preventing international economic difficulties arising purely out of financial reasons than more ambitious plans—put forward by Professor Triffin—providing for the absorption of existing foreign-exchange assets (and liabilities) by the International Monetary Fund and their liquidation.[1] The liberal attitude of the United States Government in permitting the loss of some $4 billion in two years without severe restrictive action, which enabled the replenishment of European reserves through an improvement in the balance of payments, contrasts painfully with the sluggishness with which the Western European countries responded to the need to ease the problem of the United States. The strengthening of the Common Market will further increase this trend. This emphasises the need for more conscious institutional safeguards internationally.

(b) *Reducing the Need for Reserves*

The need for reserves would be reduced if a mechanism existed which would impart alternating bias to international adjustments so as to preserve or restore the balance in international payments at a high and stable level of employment. The bias would have to alternate according to whether employment was rising or falling.

At, or nearing, full employment it would be as necessary to exert an increasing deflationary pressure as it is to ensure that adjustments are made mainly by creditor countries expanding demand and economic activity, so long as there is unemployed or under-employed productive capacity. We have already pointed out that this problem is complicated by the fact that prices might be rising irrespective of the fluctuations in employment. Neither the Staff Report nor the Report of the Executive Directors[2] recognises this double requirement because of their failure to diagnose correctly the process of price inflation.

(i) *Automatic Credits: Regional or Universal Clearing*

One way to reduce the need for liquidity, and at the same time to apply some pressure on persistent creditors (to which debtors automatically are subject), is by obliging them to provide credit to carry the part or the whole of their surplus.[3] In this way the creditor will share in the inconvenience of

[1] The liquidation of these assets would be undertaken safely only if the resultant increase in the liabilities of the I.M.F. could be counted as part of the reserves of member countries. Cf. below.

[2] *Op. cit.*, Cmnd. 612.

[3] This is, in my opinion, a more illuminating way of regarding clearing arrangements than defining them as increasing international liquidity.

the unbalance, and will, within reason, *i.e.*, within the limits imposed by the general world economic position, have to contribute to the readjustment—thus he will have to promote an increase in income, demand and imports to "clear" the credit balance. This method has severe limitations. It cannot offset a persistent deflationary bias in the world economy, and it might promote inflation when all participants are fully employed.

Such clearing systems were not difficult to organise on a bilateral or (like E.P.U.) multilateral basis, so long as convertibility was limited and payments had to be made through Central Banks. They were restricted to regions within which differential liberalisation of trade and payments had been promoted and did not extend to transactions with countries beyond the regions. These were dealt with on a different (though not necessarily bilateral) basis.

The introduction of full convertibility has made the task more difficult. The consequences of the rise of the so-called free market in "transferable Sterling" in Zürich and New York exemplify these difficulties,[1] which stem from the possibility that debtors within the region might be creditors outside, or vice versa. So long as *all* countries in the region are in balance with the *outside* countries and this balance is not the consequence of special discriminatory restrictions, no special problem arises. But if the region as such, or important parts, are in disequilibrium with the rest of the world, convertibility and non-discrimination cause a conflict of interest. Direct settlement, short-circuiting central banks, becomes advantageous for the creditors within the region; the currency of the ultimate largest outside creditors will be desired by all. Thus the need for *universally* acceptable liquidity increases. The automatic credit mechanism between members can no longer function at the moment it is most required, or rather it will force the creditors within the region to finance the deficits of the debtors with outside countries. At that point the interest of the creditors in the clearing could be maintained only if they were able to obtain discriminating favourable conditions for their exports within the region. It would otherwise suit them more to use their surpluses in the most advantageous market. Thus a regional clearing would not really work in a regime of full convertibility—unless it involved reciprocal commercial discrimination in favour of the participants' exports. The proposal of creating a quasi-multilateral clearing in Europe without retracing the liberalisation in convertibility and commercial policy will founder on this obstacle.

It would, of course, be possible to provide for compulsory deposits by creditor countries,[2] and thus for forced multilateral credits. As soon as there is complete convertibility, however, regional creditors cannot possibly be

[1] Cf. my paper in *The Banker*, 1954, and Sir Donald MacDougall's evidence to the Radcliffe Committee. The Germans, in particular, made full use of this possibility of reducing their credit balances in E.P.U. while receiving 100% gold payment.

[2] This has been suggested by Professor Triffin (*op. cit.*).

required to adopt an expansionist policy—for their balance with the countries outside the clearing agreement might then deteriorate and the regional clearing does not help them to meet their obligations. In a multilateral world, as the Americans now have an opportunity of seeing for themselves, the most sluggish major creditor (at present the Common Market countries) determines the basic monetary situation. Without discrimination in favour of each other's products, self-interest drives all members of a region towards complete convertibility and the by-passing of clearings, which would reduce capability of purchasing in the cheaper market.

In a universally convertible world the answer might be sought in a *universal* compulsory clearing. The aim of forcing the central banks of the creditors to do part of the " readjustment " by providing automatic credits might be achieved by obliging the central banks of the " strong " currency countries to undertake all supporting operations of the " weaker " currencies in the " free " markets, and by providing that only part of these balances would have to be repurchased by the debtor countries against gold (or equivalent convertible currency). Credit would be provided automatically to sustain trade and payments and reduce the extent of the immediate readjustment, permitting the creditor country to expand, rather than the deficit country to contract. While this system is advantageous in a world threatened with a secular shortage of international liquidity, it would hamper efforts to impose a brake on expansion once full employment has been attained. If the present system is markedly deflationist in its bias this would be one-sidedly expansionist.

(ii) *Purposive Creation of Equilibrating Demand*

It seems unlikely that such a universal clearing agreement would be more easily negotiable than a more purposive and, therefore, more satisfactory arrangement.

The most logical and effective of such schemes was evolved at the Oxford Institute of Statistics during the War,[1] and completely lost sight of. It merits resuscitation. It provides for the automatic use of persistent surpluses of " mature " creditor countries whose creditor status is due to their less than full employment, for loans on a medium-long-term basis to be used for the acceleration of the economic development of " underdeveloped " countries. These loans would be additional to loans and grants provided for on a non-cyclical basis to promote development in order to reduce international inequality. The demand would be canalised towards the " mature " deficit countries, *i.e.*, countries in balance-of-payments difficulties to the benefit of those underdeveloped countries which need them most.

In times of general full employment the mechanism would necessitate restrictions on the part of the fully employed mature deficit countries. At

[1] *New Plans for International Trade*, op. cit.

the same time the extent of this readjustment would be limited to the minimum.

(c) *Creating Additional Liquidity*

It is unlikely that any of these " balancing " schemes could become fully operative for a considerable time or that they would work so perfectly as to obviate all increase in the demand for international liquidity beyond likely availabilities. The possibility of a scarcity of international liquidity has been accepted, as we have seen, even by the Staff and executive Directors of the I.M.F. Their recommendation was to (*a*) increase the quotas of the I.M.F. and the capital available to I.B.D.R. I shall try to show that this scheme is unlikely to fulfil the requirements. Alternative steps to increase liquidity would be: (*b*) an increase in the price of gold, and (*c*) the enlargement of the conceptions of Bretton Woods. Of the two, the latter is by far more preferable because it is more flexible.

(i) *The Increase of I.M.F. Quotas.* The raising by 50% of I.M.F. quotas was recommended last year and carried through as a full solution of the quest after increased international liquidity. It can undoubtedly palliate a really grave liquidity crisis, and is therefore welcome. It is hardly likely, however, that it will prove an effective solution for preventing less-spectacular long-run deflationary pressures, especially if the Staff Report is right in stating that most countries wish to preserve a stable ratio of reserves to imports. In any case, quotas in the I.M.F. do not formally form part of the reserves of the country, and their enlargement, therefore, does not represent an automatic increase in reserves. They can only be used with the consent of the Fund, and consent has not hitherto been given unconditionally. Inasmuch as even that part of the quota which has to be paid in gold is not absolutely at the disposal of the country, one can argue that the increase in quotas actually diminishes the fully available reserves of member countries; they certainly diminish the reserves visibly available. The Fund in 1959 rightly undertook open-market operations, *i.e.*, bought United States Government securities to offset the diminution of the United States gold reserves due to the payment by the U.S. of the increase in its quota in a period in which the U.S. were already losing gold, thereby acknowledging the fact that an increase in I.M.F. quotas is not equivalent to an increase in world reserves. While this has been a most interesting and hopeful precedent, it does not solve the problem which must be solved, *i.e.*, the *securing of a net increase of visible reserves parallel with the expansion of production, trade and payments.*

Now it is impossible to establish an internal credit mechanism without giving some discretion to its management. And these discretionary powers must include authority to impose conditions to would-be borrowers to prevent inflationary excesses. The criticism which can be levelled against the Bretton Woods Act, and even more against its interpretation by the manage-

ment of I.M.F., is that it is entirely one-sided, imposing readjustment on the debtors only, irrespective of the general world situation. The use of quotas was made conditional on the imposition of stringent general deflationary policies going far beyond the original (and already one-sided) obligation to pay an increasingly penal rate of interest and the pressure for early repayments. Thus the utilisation of these quotas will in all probability result in restrictive action, even if the world position cries out for expansion. It is completely different from countries using their own gold reserves. There is a further important drawback. I.M.F. quotas will not increase automatically with the increase in the need for liquid reserves, *i.e.*, with the expansion of output, world trade and payment. Their expansion must be specially arranged. This will take time. Moreover, *in each subsequent period the need for borrowing will increase because the ratio of " own " reserves to payments will decrease if the rate of growth of gold reserves remains below that of output and payments.* Recovery will, therefore, be increasingly burdened with repayments. A deflationary bias will be imparted to the world economy. However helpful it might be to stem exceptional crises, the increase in the I.M.F. quotas will not safeguard stable expansion.

(ii) *An Increase in Gold Prices.* An increase in gold prices could give a full (if inordinately expensive) answer to the problem of increasing international liquidity and increasing demand. It has consistently been advocated by Sir Roy Harrod, apart from interested parties. A doubling of the price, for instance, would add some $40,000 to gold reserves and substantially help to restore the " liquidity " of the two great " banking centres " and thus reduce the risk of a wholesale liquidation of sterling or dollar balances, a risk which conjures up the picture of a liquidity crisis. An increase of the gold price would also accelerate the expansion of the volume of gold production (apart from the increase in its unit-value); it might well reduce the tendency to hoarding which has been estimated at about $1 billion in the last three years alone.[1] The yearly addition to monetary gold might then increase towards $3 billion, thus sensibly diminishing the gap between the expansion of reserves and trade or output. It would increase the purchasing power of the producing areas and thus tend to maintain world demand.

The arguments against an increase in gold prices are so well known that they need not be repeated at length. It would benefit mainly South Africa and the Soviet, in no way high-priority claimants for extraordinary international largesse. Moreover, the rate of increase of reserves would not be adequate unless a quite exceptional amount of resources is devoted to gold-mining—surely a rather wasteful method. Finally, in the once-for-all gain due to the revaluation of existing reserves, those countries most in need would benefit least, because though the distribution of gold reserves has improved, it was the rather rich European countries which benefited. In any case no Republican administration in the United States would countenance

[1] B.I.S. Report, *op. cit.*, p. 117.

it for a moment. It has been, and must remain, ruled out in practical politics.

(d) *The Enlargement of the Bretton Woods Conception*

We can now draw together these various suggestions into what I think might be considered a consistent scheme. In its totality such a scheme would seem quite unattainable at the moment politically. It has, however, the great advantage that it can be achieved progressively. Such a solution should ideally combine the "liquidity approach" (*i.e.*, the capacity to create new liquidity) with the "equilibrium approach" (*i.e.*, arrangement to reduce the need for liquidity) in an organic way without mixing it in the sense that *one* institution would be made responsible for these two tasks, which might be incompatible. One single authority should be responsible for *short-term* aspects of the problem of maintaining balance between countries (including, however, that of imposing on persistent creditor countries the obligation to take action to help in eliminating the surplus). A second should be in charge of *long-term* measures mitigating the tendency to unbalance while co-ordinating these with the endeavour, now accepted by all highly developed areas, towards diminishing international economic inequality, *i.e.*, channelling capital and technical and administrative ability towards the underdeveloped areas.

It should be noted that this dichotomy of tasks has been recognised by the leading spirits of the Bretton Woods Conference in the creation of two institutions. It is unfortunate that at no time does there seem to have been a co-ordination between them to minimise deficits caused by recessions in economic activity in leading countries. But, as we have seen, the post-war obsession with inflation was overruling a rational approach to the problem.

(i) *Towards an International Central Bank*

The transformation of the I.M.F. into an international central bank would be the least costly and most effective way of dealing with the problem. This would necessitate a reshaping of the Charter on an essential point. The present system of quotas treats borrowing as "sales" to the Fund of the borrowing country's "weak" currency against the purchase from the Fund of "strong" currency. Thus there is no relationship between the changes in the reserves of a country and its position at the Fund. In fact, the *increase* of a country's "quotas" (*i.e.*, in its borrowing capacity) results, as we have seen, in a *fall* in its visible reserves because of the gold payment of 25% of the quota, and the existence of stand-by arrangements does not visibly increase the liquidity of the Central Bank. This might be regarded as basically unimportant and merely a question of book-keeping. Unfortunately confidence depends on such irrational factors, and the present arrangements are

symbolical of the incapacity of the Fund to relieve a shortage of international liquidity in such a way as positively to strengthen national reserves.

In order to bring some systematic interdependence between borrowing and repayments at the Fund and the level of the reserves, and thus the policy of member Central Banks, several solutions are available.

(*a*) It would depart least from the present constitution, if the first (gold) tranche of the quota were treated as *part of the reserve of a member country*. This solution would not increase the Fund's capacity to create liquidity. It might therefore be acceptable to the majority at present. It would represent a notable step forward.

(*b*) The next possible step would be to *increase the first tranche* of the quota from the present 25% to a higher percentage *without additional gold payments* and continue to include it in the reserves of member countries.

(*c*) Finally, *all deposits of countries with the Fund might be treated as part of the member countries' reserve*. If these remained, however, convertible into gold or other " scarcer " or " stronger " currencies the danger would remain that the Fund might be denuded of " acceptable " means of payments. Thus this final step would have to be linked *with an undertaking not to withdraw or convert deposits with the Fund*. At this point the Fund would become a central bank and the centre of a universal clearing capable of creating an adequate volume of international liquidity.

Borrowing from an international central bank would, of course, have the same effect as using the quotas of I.M.F. It would be invidious, and would force the country in question to restrictive measures. This would be perfectly justified at times when employment is high and discipline must be enforced to prevent inflation. It would not be sufficient when there is a danger o cumulative deflation. If " rediscounting " were all an international central bank could do there would be no reason to establish one.

A central bank, however, could undertake *active open-market operations* increasing the liquidity of those countries which legitimately need it.[1] Such occasion would arise if countries came under pressure because of depression elsewhere (as was the case in most primary producing countries last year).

(*d*) An elaborate new disciplinary code would have to accompany the establishment of such an institution so that the possibility of creating internationally acceptable liquid resources should not be misused. In this manner a middle way between uncontrollable inflation and undesired deflation might be found.

(*e*) Two methods are available to give creditors further safeguards as an inducement to accept such a solution. The first is to increase its vote as its deposits increase and stipulate that further creation of international liquidity would be subject to an affirmative vote by increasingly qualified majority. If, *e.g.*, the German basic deposits represent X% of the total and this increase to,

[1] The I.M.F., by buying United States securities against gold, in fact inaugurated such international open-market operations (cf. above).

say, $Y\%$, its vote might be increased by a given percentage which is in relation to X/Y and so on. Expansion of total liquidity by over 5, 10, 15, 25% per annum might be subject to the affirmative vote of a qualified majority, *e.g.*, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{3}{4}$, $\frac{7}{8}$, etc., of all votes. This would enable large creditors to veto further expansion.

Alternatively,[1] the Central Bank's maximum lending power might be limited by some formula (*e.g.*, a certain percentage of growth or a certain relationship to aggregate foreign payments).

All these are points of detail. The important thing is that means should be found by which changes in deposits or drawing rights at the I.M.F. should make themselves automatically felt (as is the case in the Gold Exchange Standard) as *an equivalent change in international liquidity of* the countries concerned and thus *automatically influence policy*. Without this the required balance in the reaction of the system cannot be achieved and it will remain biased against debtors. I think the foregoing scheme achieves such balance because the Central Bank in its lending and open-market operations can insist on " autonomous " or persistent debtors taking effective remedial action.

(ii) *Towards an International Development Fund*

When the two Bretton Woods institutions were created a wit remarked that the Fund ought to have been a Bank and the Bank a (continuously alimented) Fund. The fifteen or so years of peace-time experience confirms the prescience of this joke. The point on which the Bank's activities have least achieved the desired effect is that its lending had no relation (and under its present dispensation could not have any relation) to the ebb and flow of economic activity in highly developed areas. Yet it could have exercised a doubly beneficial effect if its aim of lessening international inequality, through stimulating investment, had been pursued so as to help in taking up the slack in international productive capacity.

I am not here concerned with the question of whether a decisive increase in the allocation of resources by highly developed countries for aid to poor areas is desirable, though it would obviously in itself contribute to the maintenance of demand. What would, in this context, be desirable is the automatic use of an increasing portion of persistent creditor balances for long-term investment in underdeveloped areas. Such a link between the Central Bank and a Fund to which longer-term lending activities are entrusted would decrease the need for international liquidity by reducing the credit (and debit) balances of persistent surplus countries and thus help in limiting the need for the expansion of international liquidity.

In the past year the dollar has been under some pressure, and the awkward

[1] This would be less desirable, as *mechanical* percentage increases in the *stock* of reserves might not be able to deal successfully with unexpected fluctuations in *flows* (*i.e.*, in the balances of payments). This is the real weakness of Professor Triffin's proposals as against the original Oxford Institute scheme.

narrowing in the gap between United States "free gold" and potential demands on it has shown the weakness of the existing arrangements. A further liquidation of the gold-exchange standard and the reduction of dollar and sterling balances could hardly help, resulting in several cuts in foreign aid and starting a deflationary spiral. Britain and Western Europe have mainly benefited by the discomfiture of the United States. But their monetary strength would be undermined by an active American policy reducing the deficit. It would therefore be no more than prudent if they took the initiative in buttressing the international credit mechanism. As a first step they might sponsor the calling of an international financial conference, to work out, as a first priority, rules of good-neighbourly behaviour which will prevent or reduce the dangers of those sudden gusts of hot money, by refusing to convert gold-exchange balances in their possession into gold. Hot money must not be allowed to endanger the stable expansion of the non-Soviet world as it did before the War. Such an international financial conference should, secondly, also set in motion reforms needed for the gradual transformation of the two Bretton Woods institutions into an effective force to stabilise growth in the non-Soviet orbit.

Institutional reform cannot accomplish much if the determination is lacking in using the instrument created. But at the moment there are unnecessary legal constrictions which would prevent the best intentions from succeeding.

T. Balogh

Balliol College,
Oxford.

REVIEWS

The Wage Rate under Collective Bargaining. By J. PEN. Translated from the Dutch by T. S. PRESTON. (Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1959. Pp. xiv + 216. 48*s*.)

A FEAR which must sometimes afflict theoreticians is that economic theory may already have given to the practical policy maker all the usable insight and guidance it ever can. The complexity and subtlety of the phenomena are such, it might be argued, that economics is driven to resort, on the one hand, to heroic short cuts like the concept of perfect competition or of general logically and temporally simultaneous equilibrium, and, on the other, to deliberate and conscious imprecision, to the use of such ideas as "welfare," "real income," "the general price level," "the quantity of capital," "the representative firm" and to Marshallian so-called "woolliness" in general. The inexactness or plural meaning of these terms is indeed inherent in them and is part of the fabric of economics, and the passing of the years makes Marshall's imprecision seem the outcome, not of defective thinking but, on the contrary, of a deep understanding of the true nature and limitations of economics. Meticulous rigour in our subject is illusory and the search for it is destructive. But is it true that there is therefore nothing left to do now except embroidery upon a garment already cut and sewn?

When, in answer to this, we point to the great gaps and abnegations of theory, the reply may be that they correspond to problems not solvable with the *economist's* tools. Economics is the pure logic of choice; to bring in psychology or to discuss tastes or the choice of ends would be a breach with our Rule. And so we are left with Edgeworth's dictum that the price in bilateral monopoly is indeterminate.

This position ought to be shattered once for all by Professor Pen's remarkable book. Here are assembled questions of what the opposing parties know and do not know; of their conjectures and risk evaluations; of their judgments of what it is, on a balance of many considerations, advantageous for them to seek; of their methods of brain-washing each other; of the effects of their fearing to lose prestige (though Professor Pen does not investigate why prestige matters); and of the psychic momentum of the bargaining contest itself *qua* game of personal rivalry; all this fits easily and naturally into the frame of an argument which never for a moment loses sight of its target, that target being the solution of a quite central and vital problem of economic theory. It is easy to make lists of "influences" which in some unspecified way may bear on the outcome of some intricate

process; to define with exactness as Professor Pen has done the elements involved in such a process and show precisely their logical relations and semantic inter-dependencies is something altogether different. Professor Pen has solved the bilateral monopoly problem, but not by means of that insufferable prig, Economic Man. It is not Economic Man's greed but his omniscience and infallible rationality that make him irrelevant.

What Professor Pen has created is a scheme for ordering and inter-relating a number of ideas, not perhaps in themselves novel but used in a highly original and unconventional way. He shows how little penetration theory has made into the bargaining problem by pointing out that even the very familiar distinction between a person's desires and his circumstances (the "internal and external limitation" on his actions) has not been applied to the bargainer. In value theory the difference of meaning between the indifference curves and the opportunity line is elementary, but discussions of trade-union policy still mix together the influences which shape the union's aims and those which limit the realisation of those aims. The expression of the union's aims is in Professor Pen's construction a curve which, because the union is not simply concerned to push the wage-rate as high as it possibly can, but, on the contrary, recognises the danger of causing unemployment, raised prices of wage-goods and other things disadvantageous to the union, has a maximum at some particular wage-rate. Another such curve expresses the aims of the employers' organisation, and this curve too has a maximum at a level of wages below which the employers see falling labour efficiency, resentment, disloyalty, labour shortage and so on. It is an essential part of Professor Pen's analysis that these curves are not to be looked on as rigid and unchangeable in form, but, on the contrary, the proximate purpose and *modus operandi* of bargaining will be to modify them gradually, until their maxima coincide at a particular wage-rate, which can then become the agreed contract rate. What limits the toughness and implacability of one side in maintaining its initial aims in face of the offers, persuasions and threats of the other? It is simply the risk of causing a "conflict" (strike or lock out, the name matters little). There will be a maximum level of this subjective probability which the bargainer can accept, and it will be equal to a very simple expression involving the three quantities: ophelimity of the most preferred wage-rate, ophelimity of the starting or existing wage-rate, the one which the *other* party has just proposed, and the net ophelimity of a conflict. (This latter ophelimity need by no means always be negative: a bargainer may for various reasons, at some stage of the negotiations, come positively to desire a conflict, though not at the price of a sufficiently favourable contract available instead.) For *each* bargainer an equation can be set up in which the bargainer's maximum acceptable probability of conflict (adjusted for the bargainer's risk-aversion or risk-preference) is set equal to the *actual* risk which he believes to be involved in his own rejection of the other party's latest bid. When these

equations, one for each party, are both simultaneously satisfied; that is, when *each* party, in his *own* judgment, has pushed the other " to the brink," then each will feel that he has wrung from the circumstances the greatest obtainable ophelimity and will be content to agree there and then to a contract.

Even the bare bones of this theory as we have outlined them give some hint of its ingenious simplicity. But no sketch in a few pages can do justice to the care with which Professor Pen has sought out every difficulty of defining and understanding the curious situation of bilateral monopoly. What in this context is the Edgeworthian " contract zone "? How can there be effective isolation of two bargainers in a world of many firms and industries and many trade unions, all wanting labour or employment? What can be meant by " power," and on what circumstances does it depend? (Power, the author says, is " a relative concept, and the extent of power varies with the proposed terms of exchange . . . somewhere within the contract zone there is a wage rate which establishes an equilibrium of power. Once this wage rate has been found, wage determination has been defined.") The author understands very clearly the function of a scheme of thought such as he has constructed:

> "We do not ask of the bargainer that, to answer the question whether he will continue to bargain or will conclude a contract, he should first calculate the advantage which he hopes to gain with further bargaining, and should then divide this by the disadvantage which—compared with an optimum contract—he would suffer in the event of a conflict, and after that should value the quotient found as a risk factor, and compare the risk factor computed in that way with the actual risk of a conflict. . . . However, we think that this procedure offers a starting point from which to establish afterwards why a bargainer was ready to accept a contract at a certain wage rate, and so to systematise the factors which brought this about."

This modest, practical descriptive function could well be more generally recognised as a *sufficient* justification for theory-building. This is the right claim to make, and it is here very fully established.

If the reviewer has complaints about this book they are not directed to the author. There are a few rather tiresome misprints (the eternal confusion between the numeral *one* and the letter *el* has here been made by a printer yet again, with variations) (pp. 132 and 200). The diagram on p. 38 is hopelessly at variance with the text, and even in the diagram on p. 84 (which is perfectly intelligible nevertheless) the lettering of points is at fault. The notes to each chapter are gathered at the end of the book. For Chapter III those referred to in the text by numbers 28–43 are entirely missing. There is no index. The publisher of this book is the Harvard University Press.

If it is incumbent on a reviewer to find at least one matter of substance on which he can differ from the author's view, perhaps this reviewer should

try to do what is expected of him by asking whether the notion appropriate to defining that " brink " up to which, but not beyond which, each bargainer seeks to push his opponent, may not be *possibility* rather than *probability*? For the author nowhere states or suggests that we are to look on each instance of bargaining as one of a series. The bargainer, we must suppose, is really anxious not to push his opponent too far, he does not merely reckon an occasional accident as the price of his long-period prestige and bargaining power. If we are right in this it is the *possibility* of a conflict which concerns him. Possibility, like probability, is a matter of degree, but there is no unique one–one correspondence between their degrees.

If there is any justice in the world, this book will achieve its place amongst the classics.

G. L. S. SHACKLE

University of Liverpool.

The Public Stake in Union Power. Edited by P. D. BRADLEY. (Charlottesville, Virginia: University of Virginia Press, 1959. Pp. x + 382. 56*s*.)

THESE essays are based on lectures given in the University of Virginia by a group of distinguished economists who had little or no experience of specialist work in the field of industrial relations. The names of the contributors, including among others, Chamberlin, Knight, Hayek, Haberler and McCord Wright, command respect. All are American except Mr. P. T. Bauer, who deals with " Regulated Wages in Under-developed Countries." The exclusion of the " specialists " and the complete reliance on what are called the " generalists " stems from the thought, expressed by Dean Charles C. Abbott, that " most academic experts in this field have largely ignored two of the major public issues in the contemporary scene: the consequences of union monopoly; and corruption, with its twin ' thug unionism.' " This is fair comment on both sides of the Atlantic. On the other hand, there are generalists whose remoteness from the scene borders on unreality. It would be a gain if more specialists would escape from the inhibitions which prevent them from coming to grips both with the major issues of public policy and with the important matters of theory.

The present volume is no exception to the rule that most collections of essays are of uneven quality. But the volume as a whole is an important contribution to our literature and is greatly to be recommended. The central theme, though it is not rigorously maintained, is that there is a public interest or " stake " which can be, and often is, jeopardised by the exercise of union power. The nature of " the public interest " is not defined, and there might have been some advantage if one of the lectures had attempted to explore that nebulous conception. Where the conception is employed, as for example in most anti-monopoly legislation, there is generally a guiding

assumption such as the notion that the operation of competition promotes the public interest whereas interferences with these forces are contrary to the public interest. Of course, in any real world the problem is much less simple.

Professor Chamberlin comes nearest to the point in the opening lecture, starting from " the proposition that labor unions do have monopoly power." This raises the query whether labour monopolies are significantly different from industrial monopolies. Are the gains of labour monopolies, like other monopoly gains, obtained at the expense of all other elements of society and so contrary to the public interest? But there may still be differences which affect, on the one hand, the public awareness of the evil and, on the other, the shape of possible public policy. As regards the first of these, the effects of labour monopoly power lie " buried in the cost structure and forgotten," and this is a source of strength to the unions which exercise this power. As regards the other, there is general agreement that the procedures which may be invoked against industrial monopolies are inapplicable to labour monopolies. Professor Chamberlin does not believe in the efficacy, in this connection, of countervailing powers or of government wage-fixing methods or, by implication, of national wages policies as commonly understood. He thinks that the problem could be dealt with by attacking those accretions of power which form no part of the collective bargaining process *per se*. Thus unions might be subjected to the anti-trust laws in respect of practices which lie outside the field of employer–employee relations; legal responsibility with regard to contracts should be similar to that required of other organised groups; where there is a closed shop union members should be protected against the abuse of union power; picketing should be subjected to substantial restrictions; loopholes in the Taft–Hartley ban on the secondary boycott should be closed; and unions should not be allowed to concentrate their resources on ruining a single employer.

The other major issue relates to the problem of inflation and the influence of wage movements in generating inflation. Professor Haberler argues in relation to the wage-push or demand-pull debate that the crucial operational question is whether, in the event of demand being controlled sufficiently to prevent a general rise in prices, employers' resistance to wage demands would be stiffened to the point of ensuring that the resulting wage level would be compatible both with the given price level and the maintenance of full employment. Or would union pressure succeed in pushing wages beyond that level, with consequent unemployment? In a later essay Professor Falkner makes a valuable contribution to the discussion of demand inflation, cost inflation and collective bargaining. It is difficult to avoid the thought that experience lies on the side of the pessimists, but among the pessimists there are two opposing views. There are those who think that creeping inflation is unavoidable and that it is a lesser evil than unemployment and loss of output. Chamberlin does not accept this conclusion. But there is also

the question whether full employment without inflation could not be achieved by means of a change in the present methods of collective bargaining. This, in my view, is a crucial issue and one which deserves fuller consideration than it has, as yet, received. Unfortunately the willingness of the two sides of industry to discuss the matter in serious terms is bedevilled by the fear that, in the mere discussion of the problem, some tactical advantage would be given away. But there are signs, at least in this country, that a change of attitude is possible in the foreseeable future.

Space does not permit adequate reference to the other essays and in particular to the thoughtful contribution from Professor McCord Wright, who finds a long-run close association between the values of economic growth, political freedom, democratic opportunity and the free market. But Dean Abbott has much cause to be satisfied with the result of his experiment.

D. T. JACK

University of Durham,
Newcastle upon Tyne.

National Wages Policy in War and Peace. By B. C. ROBERTS. (London: Allen & Unwin, 1958. Pp. 180. 15*s*.)

THE main aim of this book is to discuss how useful national wages policies have been as a tool of anti-inflationary policy. In the central chapters accounts are given of wage policies and economic developments in a number of countries with varying degrees of centralisation in their wage-fixing institutions. Mr. Roberts discusses the experience of the Commonwealth Court of Conciliation and Arbitration in Australia and of post-war wage policy in the Netherlands, examples of a high degree of centralisation in wage fixing for fairly prolonged periods. He gives accounts of government intervention in wage fixing, regarded as an emergency measure, in Britain and the United States in war-time and in the United States in 1950–52. He describes developments in post-war Britain and Federal Germany, and wage policy in Sweden, where such a thoroughgoing attempt at central control of wages as in the Netherlands has not been made, but where wage negotiations are considerably more centralised than in Britain, the United States or Germany. In these chapters the general economic developments, the objectives of the wage policies pursued, and also the institutional frameworks and the political attitudes and opinions among trade unionists and employers towards wage policy are discussed.

Mr. Roberts stresses that wage policy must be " set in the framework of the social and political institutions, traditions and practices of each nation state." Swedish and Dutch trade unions, for instance, have been willing to submit to much more influence and control from their own central organisations than have their British and American counterparts.

Mr. Roberts points out that wherever the central wage-fixing authorities

have attempted to use wage policy as a brake in a generally inflationary situation by maintaining a level of wages lower than that which the trade unions feel that they could achieve by bargaining, or that which the employers would be willing to pay in order to get labour the system has been subject to considerable stress. This led in the United States to the breakdown of the Wage Stabilisation Board before the threat of a mine-workers' strike, and in the Netherlands to increasing demands in 1954 and 1955 from some of the employers' and workers' representatives for greater flexibility in the system of wage determination, demands that were to some extent met in the wage settlement of 1956. He says that " failure has been due, not to a lack of knowledge but to the difficulty of persuading people to act in a manner which seems contrary to their immediate interests."

Mr. Roberts argues that where there is demand inflation a national wage policy cannot be successful, and that it would be redundant if excess aggregate demand is prevented by other measures. He shows that the idea of a national wages policy is unpopular among British trade unions. He advocates that monetary policy should be used to control inflationary pressure, leaving the trade unions free to pursue the immediate interests of their members in collective bargaining. He favours a more decentralised system of collective bargaining, so that the official wage structure may be better adjusted to differences in local circumstances and so that there is less likelihood of a single wage claim becoming a major political issue.

The conclusions drawn in this book are rather more sweeping than seems justified by the general historical evidence presented. The experiences described do show that a centralised wage policy, especially when not wholeheartedly supported by the parties on the labour market, cannot be relied on to preserve price stability when other tools of economic policy are working in an inflationary direction. But a national wage policy, even if the intentions of those pursuing it as to wage structure and development are not completely effective because of wage drift, and even if, as in Sweden, less centralisation and less restraint can be agreed to in some years than in others, may still be a useful extra tool of economic policy, and may contribute towards the achievement of a higher rate of growth without excessive inflation.

THEODORA COOPER

University of Manchester.

Wage Determination: An Analysis of Wage Criteria. By JULES BACKMAN. (Princeton, New Jersey, and London: Van Nostrand, 1959. Pp. xv + 316. 51*s*.)

THE author, in addition to being Professor of Economics in New York University, has been an adviser on labour and other economic problems to leading industries and to major corporations It is no doubt the experience which he has acquired in these two capacities which leads him to the conclusions that there are " fundamental lessons that must be learned by

union leaders and the workers they represent" and that it is "the task of economists to educate public officials, workers and the public generally as to the evil consequences of a continuation of wage inflation." He considers that "economists abdicate their role when they throw up their hands in despair and proclaim that nothing can be done about this situation."

The gist of the book is to argue the case that advances in wages (and other non-wage benefits) should be limited to advances in productivity. It does not deal with wage theory, which, the author tells us, "has little value in the give and take of collective bargaining." It examines the arguments which are customarily advanced in wage negotiation, deals with the sources from which the materials for such arguments can be culled and evaluates the weight which such arguments carry in wage determination. This description and analysis relate mainly to the United States, but occasional references are also made to Canada. Much of it, however, follows a pattern which is common in this country also despite the different institutional background. The same arguments and similar data appear to be relied on in nearly all wage negotiations, and it is this which gives to such proceedings something of a ritualistic character.

The emphasis placed by the parties on the various factors varies, of course, from time to time, and the use made of the available data appears to be highly opportunistic. Although all the usual arguments are advanced and no case appears to be regarded by the parties as complete without covering all the familiar traditional ground, main emphasis in recent years seems to have been placed on arguments based on wage comparison. In America, so far as plant bargaining is the rule, intra-industry comparisons are added to the inter-industry comparisons which constitute the main argument in British industry-wide collective bargaining.

While it is easy to formulate a list of the arguments advanced in wage negotiation, it is more difficult to assess the relative weight accorded by the parties to these arguments in the process of wage determination. Some indication can be obtained from the awards of arbitrators, and in America they seem to be less reluctant than here to give reasons for their awards. Arbitration proceedings in America are more formal and protracted than here. An account, for example, is given of an arbitration affecting railroad non-operating employees in 1947 when daily sessions lasted for nearly a month, the stenographic record of the proceedings extended to 3,252 pages and the data used ranged from the educational attainment of children to the consumption of spinach. Whether such proceedings achieve more rational results than the unsupported allegations bandied about in a single-day arbitration in this country is debateable, but it does appear that in America as here a main factor, not only in wage argument but also in wage determination, has in the post-war period been the element of comparison. It is a wage criterion which the author criticises as leading to uniform national patterns of wage increases and to rigidity. No doubt, also, in

times of high employment it is a factor leading to inflationary wage movements when there is no central control of wages.

The author sets out and examines the various proposals which have been advanced in the United States to stop the wage–price spiral. They are as numerous as the schemes which have been advocated in this country, and they do not differ substantially from them. They range from full-blooded government control to exhortation and advice in all its forms. The author sees little hope of a solution in government control of wages in peace-time. Even under conditions of war-time emergency it proved largely ineffective, and he believes that in peace-time it would be neither acceptable nor effective. His own answer is that monetary and fiscal policy must be the primary instruments of government action in this field, but he also appears to have a hankering after reducing the power of "labor monopolies."

H. S. KIRKALDY

Queens' College,
Cambridge.

Industrial Organisation. By JOE S. BAIN. (New York: John Wiley (London: Chapman & Hall), 1959. Pp. xviii + 643.)

THE high expectations which are aroused by the announcement of a new book by Professor Bain are not disappointed by this "basic text-book." It is true that it suffers from some of what appear to be the characteristic features of American basic text-books, in particular a comprehensiveness and elaboration in which everything must be explained, and each concept spelled out almost every time it occurs, just to make sure that there can be no misunderstanding. A certain repetitiveness which is useful in oral exposition (the book is apparently based on Professor Bain's lectures) can become tedious in a printed text; and the printer has provided a plentiful supply of misprints to add to the complications of the occasionally somewhat involved style. In spite of all this not merely undergraduates but those who are already versed in this field will be repaid for the labour of reading through its six hundred and fifty pages.

The book falls into three parts. After three introductory chapters, which provide an analytical setting of types of market structure and a general description of the "environment" of American industry, there are eight chapters which constitute the main argument; these analyse American industry in terms of market structure, market conduct and market performance, with emphasis on the inter-relations between these three criteria. Finally, there are four chapters on government interventions which affect competition.

Market structure has four chapters out of eight in the middle section of the book, and is treated at almost three times the length given to either

Conduct or Performance. The central theme is the degree of concentration of control (in buying as well as selling), which is shown to be far from the simple concept which is often too readily assumed. A wealth of material is assembled to elucidate the different patterns of market structure as shown by various degrees of concentration in different industries, in which " variety rather than uniformity " is found to be the distinctive feature. The determinants of concentration are analysed in a fairly short chapter, in which it is shown that " there is no one simple force determining concentration and no especially simple explanation." This is linked with a useful chapter which surveys changes in concentration in United States industry over the past ninety years, with the important conclusion (among others) that " any drift toward higher concentration requirements for efficiency has been for several decades at least fully offset by market growth," a point which is often overlooked. Finally, there is a discussion of the relation between product differentiation and conditions of entry into markets; the author's earlier studies in this field are well known, and this text provides a useful summary of his conclusions.

Market conduct is concerned partly with arrangements by sellers for determining outputs and prices, including independent, collusive and quasi-collusive action, and principles and methods of price calculation; on the latter, Professor Bain is emphatic that " margin-adding as a price-making device does not contradict or even seriously bring into question the hypothesis that a variety of maximising principles of price making are systematically being applied." There is an interesting review of this aspect of market conduct in a number of industries. Other matters covered are the determination of selling costs and " predatory and exclusionary tactics." Market performance is " the crucial indicator and measure of how well the market activity of enterprises contributes to the enhancement of general material welfare." It has various dimensions: productive efficiency, progressiveness in techniques, the suitability of the products, conservation of wasting resources and price flexibility. Professor Bain believes that on all of these matters except the first the evidence on which to reach any definitive conclusions is inadequate; thus, " we cannot honestly do much more than acknowledge the record of technological change in each industry, being grateful for gifts received from progress where it occurs, and must leave the evaluation of ' progressiveness ' performance blank for the moment." Equally, the results of " theorizing are so inconclusive as to be almost useless." His comments on the other dimensions are also more " theorizing " rather than examination of empirical evidence, and the treatment accordingly brief. Perhaps this scepticism about the value of inference from incomplete (though not always negligible) evidence is on some matters carried a little too far.

For productive efficiency, however, the evidence is regarded as adequate; it includes the author's own investigation of twenty industries, which he has

also used in earlier studies. A result of particular significance is the relative unimportance of economies and diseconomies of scale: " in a preponderance of cases, plant scale curves tend to be at least moderately flat (and sometimes very flat), so that plants of half-optimal scale would experience no more than a 2 or 3 per cent elevation in unit costs and plants of quarter-optimal scale no more than a 5 or 6 per cent elevation," while " even where there are some large-firm economies, then, they are not very important, since the scale curve for the firm, beyond the size of one plant, is typically quite flat." Specific findings for the twenty industries are, *inter alia*, that in all the great bulk of output comes from plants of " reasonably efficient " scale, though with a fringe of " inefficiently small " plants, but that concentration of control is either moderately higher or much higher than is required for productive efficiency: while warning against too sweeping generalisation in this field, especially on the basis of a limited sample, the results " do lend support to the thesis that in at least half or more of all [manufacturing] industries the leading firms are in significant degree larger than necessary from the standpoint of efficiency in production and distribution, and that seller concentration is, in a corresponding sense, unnecessarily high." In consequence, the " impact of market structure on performance is probably found in the main with respect to dimensions of performance other than efficiency." Analysis of profits leads to the general conclusion that " high excess profits " are largely monopolistic profits, rather than the result of rewards to innovation and the like, and that they are mainly a consequence of high seller concentration together with high barriers to entry.

These, and other, conclusions are highly relevant to the discussion of government policies, which is conducted in terms of the analysis of the relation between market structure and performance. There is an admirable review of the anti-trust legislation; this section could, indeed, be used as the best up-to-date general account for students in this country, while one conclusion, that " prohibition of collusive behaviour cannot properly be viewed as a sufficient public policy toward monopolistic tendencies, or as the keystone of a general policy with this orientation," is of considerable significance for present problems here. Professor Bain also reviews, with unfavourable results, policies for the support of agriculture, of small units in the distributive trades, and of areas adversely affected by economic change.

It is impossible in a short review to do justice to the wealth of material and ideas which Professor Bain puts before us. This volume is more than a textbook (even for what must be the strong stomachs of American students); it is an authoritative and, in spite of its laboriousness, a stimulating survey of a wide range of problems in the particular setting of American industry as a case study of an " enterprise economy."

S. R. DENNISON

The Queen's University,
Belfast.

Taxation of Agricultural Land in Underdeveloped Countries. By H. P. WALD. (Cambridge, Mass.: Harvard Law School International Program in Taxation, 1959. Pp. 231 + xiii. 36*s*.)

THIS book surveys the whole range of land taxation—taxes based on land area, rental values, incomes, incremental values and so on. In Part I the different taxes, their characteristics and their importance are described. In Part II the merits of land taxes are discussed from the viewpoints of equity, administration and general economic policy. Part III suggests ways of making land taxation more effective and how it could be used to further particular policy ends.

The author has gone into this subject extremely thoroughly and ranges with care over the many problems of development in many areas. The result is a most valuable storehouse of information about land-tax practices and problems which is not available anywhere else in such a handy form. At the same time some of the argument, especially at the theoretical level, is rather tedious and pedestrian; more ruthless cutting would have improved the presentation and enlivened the arguments.

One cannot avoid the suspicion that the author is sometimes flogging a dead, or at any rate a dying, horse. If land taxation cannot be made to work without such effort, why try? Is it not likely to be a better use of the scarce resources of underdeveloped countries to improve the administration of established indirect taxes and push ahead with the development of a wide-ranging personal income-tax system of some sort? Despite these reservations, it is still very valuable to have all the arguments for land taxation clearly set out.

One final point should be made about this book. Both economists and laymen in this country should ponder on the fact that this highly technical economic study springs from the *Law* School of an American University.

A. R. PREST

Christ's College,
Cambridge.

The Balance of Payments of Rhodesia and Nyasaland, 1945–1954. By A. G. IRVINE. (London: Oxford University Press, 1959. Pp. xiii + 642. 63*s*.)

THIS volume must represent a record of its kind. Surely there is no other unadorned balance-of-payments study which runs to more than 600 pages of text and a total of 161 tables! Nor does it digress. With the exception of a brief historical review, which is concerned to demonstrate that the author owes nothing to his predecessors, the book is exactly described by its title.

In connection with the historical review only two comments seem to be required. The first is that the opening sentence, to the effect that " no

estimates of the balance of payments of any of the three Central African territories . . . were made before 1939" (p. 1), is not true. An estimate of the 1931 balance of payments of Northern Rhodesia appeared in a book published in 1933 (*Modern Industry and the African*, edited by J. Merle Davis), and the working papers were carefully preserved on the files of the Northern Rhodesian Customs Department as late as 1947. Secondly, it is only fair to note here that this reviewer is summarily convicted of gross errors of concept and fact, which were perversely allowed to appear in print after the author had produced his first estimates on the same subject. It is possible to answer some of the charges in this systematic indictment; however, since Mr. Irvine's object in making it was not to raise any issues of theory or fact but to establish, in his usual thorough fashion, his own claim to be effectively first in this field of study, any argument seems superfluous.

For there is no doubt at all that this is now the definitive text on the balance of payments of the Federation and its component territories. The practical statistician faced with a similar task in some other colonial or semi-colonial territory and the economist whose analysis depends on a proper interpretation of the Federation's trade figures will find this an invaluable reference book. Whether Mr. Irvine will succeed in preventing economists from ever again using Rhodesian balance-of-payments statistics compiled before he began his work in August 1947 is not so certain. For economists are notoriously deviant in their use of statistical data, being always liable to use existing estimates where no reputable data are available.

The two chapters on concepts and measurement are by far the most interesting in the book. The author took as his starting point the I.M.F. *Balance of Payments Manual*, but the Federation threw up many major problems of interpretation which, in the last analysis, could only be dealt with arbitrarily. These he discusses in rewarding detail. The most intractable problem, of course, is the definition of a "resident." Here the basic principle adopted is the "centre of interest" criterion. A resident is one whose "centre of interest" is wholly or mainly within the Federation, and in the case of resident institutions this principle is extended to include the requirement that they should be "an integral part of the country's economy." These are vague enough criteria for practical purposes, as the author recognises, and they leave considerable scope for variation in treatment. After the visible trade section of the balance is explicitly designed to provide a record of merchandise transactions between residents (so defined) and foreigners, for example, it seems a little odd to find that "all entrepôt trade is included in both imports and exports on a gross basis, and all entrepôt stocks are recorded as domestic investment" (p. 97).

Some two-thirds of this volume is taken up with an exhaustive, entry by entry, comment on each item of the balance for each territory and for the Federation as a whole. It would perhaps be an exaggeration to say that if a randomly chosen half of Mr. Irvine's tables had been omitted by a weary

compositor they could have been reconstructed in full from the remaining tables and the textual commentaries. But it is certain that many nine-year series are repeated three or four times in tabular form and that the textual commentary on each table involves much repetition of the figures and mechanical statement of the obvious.

Overlaid by this dull mass of detail, however, there are some descriptive gems of considerable intrinsic value. The description of the operation of the " colonial sterling exchange standard " on pp. 550 *et seq.*, for example, is a model of its kind; and there are various other aspects of the mechanism of international transactions which are splendidly defined by Mr. Irvine's exhaustive descriptions. The trouble is that in his determination to give every figure its full treatment in text and table, the author has smothered some unusually interesting contributions in a tedious stream of trivialities.

PHYLLIS DEANE

Department of Applied Economics,
Cambridge.

Cybernetics and Management. By S. BEER. (London: English Universities Press, 1959. Pp. xviii + 214. 25*s*.)

CYBERNETICS (κυβερνήτης, a steersman, *gubernator*, a governor) is the science of the control of complex systems; not control in the repressive sense which we have all come to hate, but control in the sense of the co-ordination and harmonious working of interacting components. The ideal controlled system is the one which controls itself without any outside control. The human body, for example, considered as a machine for maintaining a constant blood temperature, is self-regulatory. So is the automatic pilot of an aeroplane. So also were large sections of the economic system believed to be until recently. The cybernetician is concerned with the general structural properties of controlled systems, with studying their behaviour, with setting them up and with designing them economically. In consequence, he ranges over a wide field of interest, from the simple regulating machinery of a steam engine to the properties of the human brain, from running a chess club to the organisation of the biggest industrial combines, from business management to the control of the whole economic system.

Mr. Beer's book is an admirable introduction to the basic ideas of the subject, stimulating, not too long and drawing on a wealth of examples from many fields. It will not turn the reader into a cybernetician, but it can hardly fail to convey to him the importance and the fascination of the subject.

The book is in four parts. In the first Mr. Beer develops the fundamentals, stressing the importance of feedback in control systems, the problem of communicating information through a system and the possibility of studying behaviour of highly complicated systems by regarding them as Black Boxes. (A Black Box is a set-up for which we can observe the output

for given inputs, and hence study its behaviour operationally without necessarily understanding what goes on inside.) In the second part the author discusses the logical theory of cybernetics—logical algebras, binary decisions and the theory of automata. It is interesting to find that some of the oldest problems of logic (especially the one about " Minas the Cretan says that all Cretans are liars ") have a direct bearing on the design of automatic control systems.

In the third part Mr. Beer goes on to what he calls the biophysical theory—the construction of machines for adaptive behaviour, machines that learn and teach, and the possibility of constructing intelligent machines. The fourth part deals with the " materials " from which cybernetic " machines " can be constructed; the words in quotes are used in the widest sense, so that, for example, random numbers are a " material " from which a simulator of chance can be built; and a " machine " can be built of colloid material so as to grow.

In these two last parts, perhaps, the reader will begin to feel his feet leaving the ground. It is fascinating material, and much more than pure speculation. But the business manager who is reading this book to find out whether he can improve his own organisation will probably wish that he could be taught to walk before he can run, and run before he can fly. However, Mr. Beer's object is to survey the field of present and future possibilities, not to provide a text-book for the cybernetic practitioner, and in this object he has certainly succeeded.

The central problems of economic action, so it seems to me, are essentially of a cybernetic kind. Economists are now sufficiently alive to the importance of trying to trace all the connective relations in a system before its stability and oscillatory behaviour can be adequately discussed. Feedbacks and closed-loop models are becoming a standard part of the econometrician's methodological tools. But we still know extraordinarily little about certain determinants of economic behaviour—for example, how long it takes for a rise in the bank rate to affect savings and expenditure, or how long rises in earnings take to lift consumers' expenditure to new stable levels (if at all). The lengths of these time-lags and the magnitudes of responses are just as important to the stability of an economy as the nature of the inter-relationships themselves. Until we can measure them we shall continue with our periodic drains on exchange, our sudden changes in bank rates, our pig cycles and our nervousness about over-production and under-employment. Economists, who have been talking cybernetics for centuries without realising it, can gain a great deal from the study of self-regulatory systems in other disciplines, and many of them would, I think, derive profit as well as pleasure from this very readable book.

M. G. KENDALL

London School of Economics.

Organizations. By J. G. March and H. A. Simon. (New York: John Wiley for the Graduate School of Industrial Administration, Carnegie Institute of Technology (London: Chapman & Hall), 1959. Pp. xii + 262. 48*s*.)

Professor Herbert Simon has built up a well-deserved reputation for systemisation in problems of administration, and his *Administrative Behaviour* is on the way to becoming a classic. The present volume widens the scope of the activities surveyed and yet still further refines the system, so that a set of over two hundred propositions "a numerical index to variables" is provided. Yet, forbidding as this sounds, the text of this book must, for brevity and relevance to their thought, be given high priority in economists' background or collateral reading. After an illuminating sketch in Chapter I of the many hands providing bits and snacks of organisation theory and data, the authors get down to assembling the jig-saw puzzle.

They start (Chapter 2) at a place that should appeal to economists—Scientific Management and the study of Industrial Fatigue, which I can recall as introduced to Cambridge classes by Pigou as early as 1913. This proved in time too mechanical an approach, and the authors proceed to take up the unanticipated consequences of treating an organisation as though it were composed of machines; there are "motivational constraints" on decisions within (Chapter 3), and decisions to participate at all (Chapter 4) in organisations, and also conflicts (Chapter 5) in organisations. These three chapters introduce us to morale and its relation to production, to labour turnover (the end of participation), to incentives, group pressure and identification, but pay less attention to Elton Mayo than might be expected. Simon's model for tackling the decision to participate, expounded in his *Administrative Behaviour* and summed up here, will strike a familiar chord. It is an input–output equilibrium or "Inducement-Contributions balance," round which to range the irrational and rational factors involved, such as the propensity to search for and perceive alternatives, the ease of movement and the personalities of the participants. The authors work through finally to consider the rational action (Chapter 6) and the planning and innovation (Chapter 7) which economists postulate of the entrepreneur in the first instance.

A further recommendation to economists is that with the exception of some rather novel adjectives (Professor Devons is, p. 205, called "insightful") there is a welcome absence of the sociologist's professional jargon. What jargon is used is largely the modern economist's own. With rate of innovation and decision-making, appear marginal calculation, production and utility functions, programming, resource-allocation, game theory and optimality. However, economists must be warned that the authors believe (p. 205) that in the real world satisficing (*sic*) rather than optimising must be looked for, and that they use external economies and diseconomies (on

the same and other pages) apparently to refer to differences of social from trade net product.

The authors are not just content with a model of terms and conceptions. They join some economists and also (though surprisingly cold-shouldered) some political scientists like G. E. G. Catlin, in lamenting the absence of research. Their last words (p. 210) voice the complaint that empirical evidence of a reliable and persuasive kind is almost non-existent. And this complaint they claim to have made throughout the volume. It is disappointing therefore that the authors have not built upon recent empirical inquiries into the economic world, their knowledge of which appears rather out of date. It is particularly odd that American authors should ignore the implications of the empirical evidence supplied by Gardiner Means and R. A. Gordon on the scope of the large American Business Corporation and the Managerial Evolution.

In analysing the participants (p. 89) of business organisations they lump the participant who is emerging as the most important of all—the top manager in a company—with all salary and wage-earning employees, and the whole lump is ranked with the other minor participants—the shareholders, suppliers, distributors and consumers. The manager, moreover, apparently takes the initiative only when (p. 109) adjustments are necessary for survival. Models of bureaucracy are, it is true, discussed at some length (pp. 34–37), but the top hierarchy which figures in all the three models selected is not identified realistically, and English readers are likely to miss any reference to Urwick's optimum span of control or Parkinson's Law.

It is still more disappointing that the authors announce no projects of their own for empirical research. All they do is to hope their labours " will be more than repaid if they encourage others to join in the task of replacing fancy with fact." Let us hope, however, that " join " means " join *them*," for some real field-work under the auspices of Professor Simon with his flair for integrating economics with other social sciences would indeed be welcome.

P. Sargant Florence
University of Birmingham.

Studies in the Theory of Money, 1690–1776. By D. Vickers. Philadelphia, (Pennsylvania: Chilton Company, 1959. Pp. viii + 313. $6.50.)

" This book," the author says in his Preface, " is a systematic examination of the monetary theories which developed in England in the hundred years preceding the appearance of Adam Smith's *Wealth of Nations*." It treats of nine authors: Locke, Barbon and North, writing at the end of the seventeenth century; Law, Berkeley and Vanderlint, who are classed as Inflationists; Cantillon, Hume and Steuart, who are credited with introducing " process analysis " or dynamic theory. The book is a valuable

contribution towards understanding the monetary theories of the period. It has relatively little to say about the coinage troubles about which so much has been written, but the author lays stress on the preoccupation of all the nine with the question of employment.

Locke perceived the essence of the quantity theory of money: "any quantity of money (if it were but so much that everybody might have some) would serve to drive any proportion of trade, whether more or less; there being counters enough to reckon by" (p. 61), and "the value of money in any one country is the present quantity of the current money in that country in proportion to the present trade" (p. 67). Were the money halved, either half the work-people would be unemployed or money incomes would be halved (p. 56). Locke thus brought out clearly the aim of so adjusting the supply of money as to maintain full employment. The later writers recommended various expedients for keeping up the supply of money: luxury spending might be encouraged; a favourable balance of payments would add to the monetary supply by imports of bullion; the use of paper money and of credit could be expanded.

The book brings out the various points of view very effectively, and traces their development in the course of the period covered.

It is interesting to note that an increase of credit was regarded as primarily facilitating consumer expenditure by the rich. Before the Industrial Revolution investment in industrial plant as a source of expenditure and therefore of demand for labour was hardly thought of. Barbon saw that the common view of interest as paid for the hire of money was a mistake, "for the interest is paid for stock," but Professor Vickers rightly interprets "stock" to mean working capital (p. 91). Hume mentions among uses for which men borrow money that of supporting a manufactory (p. 235), but did not distinguish between the yield of plant and the profit on the sale of products as a source of interest.

Even when Steuart wrote (1767), industrial capital had not secured a place in analysis. His theory of banking treated improved land as the only form of fixed capital. Steuart is the only one of the nine who wrote a treatise on economics, and the chapter devoted to him (pp. 240–90) is longer than any of the others. His most notable contribution to the subject was the concept of money of account, which is very judiciously criticised (pp. 274–80). Steuart describes money of account as "no more than an arbitrary scale of equal parts invented for measuring the respective value of things vendible" (pp. 277–8).

He imagined that the unit of account, being a measure of value, possessed in some sense stability of value, and that its link with gold or silver impaired its stability because the metals themselves were liable to vary in value. He advocated a system of bank money based not on gold and silver but on property. There was here some confusion of ideas. Professor Vickers does not quite go to the root of the matter (pp. 279–80). Is not Steuart's

fallacy essentially contained in the conception of the money of account as a unit for measuring *value*, instead of as a unit for measuring *debts*? The measurement of debts includes the measurement of prices and therefore of relative values, because the quotation of a price is an offer to create a debt. But the fabric of debts in a community has no inherent tendency to stability of value.

Berkeley came near this conception of a money of account when he asked " whether the true idea of money, as such, be altogether that of a ticket or counter," and later " whether its true and just idea be not that of a ticket entitling to power." His use of the term power is explained when he recommends as the public aim " that men's industry should supply their present wants, and the overplus converted into a stock of power." Power thus means accumulated wealth, and evidently the ticket entitling to power is something more substantial than a unit for measuring values. Berkeley, like Steuart, missed the explicit definition of the unit of account as the unit for reckoning debt. But in " the overplus converted into a stock of power " there is an interesting suggestion of capital accumulation as an object of expenditure and a source of demand.

RALPH HAWTREY

London.

British Monetary Experiments, 1650–1710. By J. KEITH HORSEFIELD. (London: Bell, 1960. Pp. xx + 344. 45*s*.)

THE recoinage crisis of 1696, Mr. Horsefield remarks, was the last occasion in English history when a monetary controversy centred in the state of the coins. Thereafter, interest moves from coins to bank-notes as the major vehicle for internal payments. This is another way of saying that the underlying theme of the book is the growth and development of credit investments and institutions—bills of exchange, promissory notes, cheques and the banks which operate them. The climax came in the years 1694–96 when the appalling state of the silver currency combined with the exigencies of war to produce a crop of schemes for banks, including the Bank of England, the Bank of Scotland and the ill-fated Government Land Bank. While the first had to suspend payment, and the last failed, the recoinage was carried through and the Exchequer Bill made its debut. Round these stirring events swirled a shower of pamphlets. 1695 and 1696 alone saw the production of at least 250 pamphlets, and many more probably disappeared. Clearly Mr. Horsefield has chosen a fruitful if difficult field of inquiry.

He has chosen to begin virtually at the end, chronologically speaking, of this problem, with the recoinage controversy, going on to examine the role of the guinea. Next comes a study of banks and paper money. Finally, he examines the theoretical arguments put forward during the controversies —the adumbration of the self-balancing mechanism of international pay-

ments, the theories of banks and the idea of a "fund of credit" that was connected with the war-time need to transfer tax proceeds from the provinces to London.

The handling of the recoinage crisis and controversy is a considerable *tour de force*. As Mr. Horsefield says, the story has been told often and he does not repeat it in full. His contribution lies in quantifying—as he does convincingly—a situation which neither side in the controversy fully appreciated. The "restorers" proposed to put back the coins to the nominal weights of the Elizabethan recoinage. The "devaluers" proposed a devaluation of some 20%. Both measures were deflationary—the restoration rather more than the devaluation. But the restorers, amongst whom John Locke was an important figure, won, bringing the major benefit to creditors, landlords, most workmen and recipients of fixed incomes generally, including the King. Business-men, by and large, stood to gain little and sometimes to lose.

It is Mr. Horsefield's contention that advocates and opponents of devaluation alike were misled by a failure to understand the actual monetary situation, *i.e.*, the fall of 32% (should it not be 35%?) in the money supply in 1696. Few realised that the basic problem was the monetary standard. And the currency shortage resulting from the recoinage was, it is argued, the reason why the Land Banks of 1695–96—precursors in one sense of the Building Society, as Mr. Horsefield points out—failed. In both England and Scotland, therefore, banking was practically confined to a single institution that managed, though precariously, to survive the crisis.

The sections about banks follow from consideration of currency decline. "What remedy is there," asks Petty, "if we have too little money?" Answer: "We must erect a bank." And so the schemes of banks of various kinds proliferated, basing their credit on goods, government revenues, commercial obligations or land.

Mr. Horsefield's strength lies in his technical equipment as an analyst and in the skill which he has brought to the task of statistical reconstruction. The complex problems with which he deals have not previously had such penetrating treatment. On every point he has something new and arresting to say. Yet a price has to be paid for these expert probings in depth. His somewhat allusive exposition makes heavy demands on the reader. It is not clear what considerations govern his choice and rejection of topics for treatment. The studies remain separate studies and are hardly welded into a whole. Even the professional might legitimately plead for more guidance through these perilous waters. The studies might also have been bonded more securely into the larger context of economic development. The rise of government borrowing is sketchily treated. It is hardly sufficient to rely on W. R. Scott's indicator of trade conditions, which is now fifty years old and open to criticism in the light of later work. It seems curious that in a study of monetary problems little mention is made of the silver drain to the

East and elsewhere. A study of this period might also profitably have included a look at the European situation, especially in Holland, where similar problems are revealed in Dr. van Dillen's records of the Amsterdam Bank. One hopes the Mr. Horsefield will extend his inquiries to give us an authoritative and connected financial history of this period, which he is clearly so well qualified to do.

CHARLES WILSON

Jesus College,
Cambridge.

An Economic History of Transport. By CHRISTOPHER I. SAVAGE. (London: Hutchinson, 1959. Pp. 216. 18*s*.)

TRANSPORT historians, as a rule, are dedicated to detail. They revel in technical data and go to endless pains to establish when this section of track was opened or that lock built. But with the economic purpose of these developments they are usually unconcerned. Even broader surveys, such as E. A. Pratt's *History of Inland Transport and Communication in England* and W. T. Jackman's *Transportation in Modern England*, which do touch upon economic questions, do so only incidentally amidst pages of narrative. There is clearly the need for a short and readable book which treats the subject generally and in economic terms and, in addition, deals with the period since the First World War.

Mr. Savage devotes just under half of his book to the inter-war years. The introductory chapter of his War History volume on *Inland Transport* has provided a sound foundation on which to build, but he has not chosen here to venture beyond 1939. The growth of road competition both in short- and long-distance passenger services and in goods traffic is ably summarised, as are the State's efforts at safeguarding the public interest on the railways and restricting damaging competition on the roads. Although the author agrees that the Government handicapped the railways by treating them as a monopoly even after road competition became severe, he argues that they were themselves partly to be blamed for some of their misfortunes because of a too rigid interpretation of some of their obligations, such as those relating to " undue preference." It would have been useful had he been able to explore a little farther the whole question of railway efficiency. What effect, if any, for example, had railway investment in buses in discouraging the improvement of local services by rail, which were the costliest of all to run?

The earlier part of the book, which deals with British transport history from the eighteenth century to the First World War, is disappointing It contains little more than the familiar string of unexplained events; no serious attempt is made to discuss transport developments as *economic* history. Railway amalgamation is outlined without reference to price movements, as is

the greater emphasis on improved service which accompanied falling prices after the early 1870s. The assertion that "railways could and did provide cheap, rapid and safe travel for all classes of society" needs qualification. When, in fact, did railways begin to cater for the "labouring poor"? Should there not be some indication of wage levels or of the contribution of workmen's fares and excursion trains instead of merely the unsubstantiated assertion that "the poor man . . . got his charter in 1844"? Or, moving back in time, should not any discussion of coaching go beyond the well-known examples of higher speeds to investigate fares, the cost of running coaches and the fortunes of coach-operating firms—to explore, in fact, Jackman's Appendix 6 as well as his Appendix 5?

Even as an outline of fact in the traditional pattern, the eighteenth- and nineteenth-century section of this book is wanting. Mr. Savage would have done a good service to teachers of economic history had he made more readily available the conclusions of recent research which are at present not widely known; but instead he pins his faith in the older writers. The account here of the beginnings of the Canal Age, for example, adds nothing to what Samuel Smiles wrote a century ago: no attempt is made to put the Worsley–Manchester venture into perspective, the old error about the Bridgwater canal's opening to Manchester in 1761 is repeated, and the fact that pits to the east of Manchester continued to provide most of the town's coal by land carriage is overlooked. It is to be regretted, too, that coastal trade has been neglected, for it forms an important part of the story. In the light of this omission the incongruous postscript on American transport, containing no information that cannot be found fairly easily elsewhere, seems all the more curious. It is a great pity that a book which may form a useful basis for those studying inter-war transport economics should, so far as the previous years are concerned, belie its title.

T. C. Barker

London School of Economics.

The History of the Hudson's Bay Company, 1670–1870. By E. E. Rich, with a Foreward by the Rt. Hon. Sir Winston Churchill, Grand Seigneur of the Company of Adventurers into Hudson's Bay. *Volume I: 1670–1673.* (London: The Hudson's Bay Record Society, 1958. Pp. xv + 687.)

"There is nothing impersonal about the story of the Company." This prefatory remark by the author sets the tone of this impressive and absorbing study of the fortunes of the early trade. Round the courtiers, princes, politicians and generals of the first managerial phase and the active commercial men who ruled the Company over the half-century preceding the Treaty of Paris, Professor Rich has woven a narrative which runs from small and uncertain beginnings to the substantial corporate achievements of the

mid-eighteenth century. This focus on personalities, incidents and events is productive of an illuminating study of business strategies conducted in the face of the complex political and economic changes of this formative period of the Company's development. Every aspect of its affairs—finance and markets, supplies and shipping, personnel, Indian relations and exploration, European rivalries and trade systems—is treated with a wealth of detail and and skill in sifting evidence which mark this work as a product of first-rate craftsmanship. A mass of material is weighed and analysed to create a clear-cut impression of the strategies of managements faced with an extraordinary range of uncertainties in the old world and the new. For those accustomed to treat in general terms the problems of initial phases of development or the preconditions deemed essential to a shift to more advanced stages of growth, this volume will provide chastening albeit instructive and thought-compelling reading. Entrepreneurial and business historians, too, will learn much from the author's skilful interweaving of economic, political and social elements into a convincing historical pattern.

To review the variety of topics discussed by Professor Rich is out of the question, but two aspects of the study may be singled out for special comment. The first relates to the strategies of management, the second to the author's contributions to a balanced view of the fur trade as a whole. Probably the most striking feature of the Company's activities is the remarkable constancy displayed by successive managerial groups in their concentration on the gains of trade rather than of Empire, on defence rather than attack, on security rather than rapid expansion. This meant avoidance of a tactic fatal to the French, namely the attempt to build a new world empire on the unstable and shifting foundations of the fur trade. A policy best described as that of a holding operation made for a rate of advance less spectacular than that of the French, but in the end it contributed much to the stability essential to survival. It was the Company's good fortune that the physical environment of the Bay ruled out any colonising role, that energies could be devoted almost exclusively to a trade which allowed for little diversification in spite of attempts in this direction. This preoccupation with business bore fruit in the progress of the Company from a state of precarious reliance on short-term loans and debentures to one of financial independence reflected in large investment holdings of the closing decades of the period. Professor Rich makes it clear that it was this long-continued interest in building a sound financial and trading position, and not monopoly at home or abroad, nor privileged status, nor importance in the national economy, that accounts for the staying power of the organisation in its first and most difficult phase of development.

Although no substantial revision of the history of the trade is likely to result from the publication of this volume, its findings go far to correct a common bias arising from past emphasis on developments in North America. The Bay, like the St. Lawrence, presented its opportunities and its problems,

but the basic policy decisions were made against the background of European conditions and rivalries, and it is this background which was to be decisive to the final outcome. Professor Rich's evaluation of the old world policies and practices which largely determined the fortunes of trade makes for a balanced presentation of events in which developments in North America are accurately placed in their wider setting. This is a major achievement and one which contributes much to making this work a fitting culmination to decades of publication of the Company's documents by the Champlain Society and the Hudson's Bay Record Society. The volume meets the high standards of the publications of the past, it is competently edited and it contains an adequate index.

W. T. EASTERBROOK

University of Toronto.

The Eastland Trade and the Common Weal in the Seventeenth Century. By R. W. K. HINTON. (London: Cambridge University Press, 1959. Pp. xi + 244. 32*s.* 6*d.*)

DR. HINTON has produced a most interesting little volume. It is full of statistics and documents. The figures come in the main from the Danish Sound toll registers and give a comprehensive picture of the extent of the English Eastland Trade during the seventeenth century; they also illustrate the degree of Dutch competition. The documents, reproduced very liberally in the appendices, include lists of members of the Eastland Company, some of its petitions and representations, and two government-inspired pamphlets on trade policy at the time of the Navigation Act of 1651.

Dr. Hinton does more than build up a picture of the extent and nature of the Eastland trade. He sets out to answer four very specific questions about it. Why did the English Eastland trade increase so considerably after 1660? How was English commercial policy formulated throughout the seventeenth century? What was the influence of the Eastland Company on the formulation of that policy? And why did the Eastland Company wither away by the end of the century?

Dr. Hinton stresses the importance of war as an explanation of the trade expansion. Strength at sea was vital for an island trading nation. This was impossible without a flourishing mercantile marine. But, in turn, the merchant navy could not flourish without sea-power. During the interregnum pressure of necessity led to the creation of a large professional navy.

> "After three Dutch wars England emerged as the dominant sea power with the safest merchant fleet. Further, by a notable stroke either of luck or policy, she emerged, in 1674, as a neutral sea-power, while the Dutch were still involved in war with France. The result is seen in the history of the Eastland trade, in the sudden and great expansion of the import trade in 1675."

The picture Dr. Hinton paints of the way commercial policy was formulated throughout the century is a fascinating one. Rightly, he dismisses the concept of the Eastland Company as a pressure group. When he goes on to add that " the influence of the Eastland Company on the formulation of (trade) policy appears to have been small," he is perhaps slightly distorting his own picture, though he is right in this connection to stress that the Government never made concessions to the Company unless they were clearly justified on the basis of the general national interest or the " Common Weal." Yet, as Dr. Hinton himself shows, in the first half of the seventeenth century the proposals the Eastland Company made were listened to with respect by the Government and frequently acted upon. As a consequence, the Company enjoyed privileges from the Government so that the cloth trade and the merchant navy could both be developed. In this, of course, the Company was not influencing the twin overall objectives of governmental policy (cloth and ships), but it was certainly influencing the determination of the means by which the Government hoped to achieve those ends.

Dr. Hinton is least convincing in his explanation of the decline of the Eastland Company in the second half of the seventeenth century. His theme here is that in the first half of the century the Company had a real job to perform. It had to maintain and extend the privileges enjoyed by its merchants abroad; and it had to protect their trade against the Dutch. In the second half of the seventeenth century it was no longer so important for the Company to perform these functions. The Navigation Acts took over the function of protecting trade against the Dutch; secondly, the Eastland merchants developed trades in which foreign privileges were unobtainable; and thirdly, the State began to look after the merchants' welfare abroad. Thus, as the " state grew the Eastland Company withered away." This is not as convincing as it might appear. During the same period, another privileged trading company, the Russia Company, was itself the subject of all these forces, yet the Russia Company did not wither away. Indeed, it continued to flourish with renewed vigour until well into the eighteenth century. There must, therefore, have been some very special reason to explain the demise of the Eastland Company, and it is a pity that Dr. Hinton has not been able to reveal what it was.

This criticism, however, must not be allowed to detract from the merits of this volume, which, if at times a little scrappy and disjointed in presentation, provides an abundance of material and interest.

N. C. HUNT

Exeter College,
Oxford.

Reshaping a City. By T. BRENNAN. (Glasgow and London: House of Grant, 1959. Pp. 221. 25*s*.)

DESPITE years of intensive building, many of Britain's large industrial cities continue to be faced with major rehousing problems. If high-density redevelopment of their decaying and thickly populated inner belts is to be ruled out for economic or social reasons the solution of the problem will involve either a continuance of the urban sprawl which has produced our conurbations or the dispersal of population to other centres. The development plans of many of these large towns make it clear, however, that there is no longer any possibility of finding enough land within their boundaries to house their present populations if reasonable provision is to be made for schools, open spaces and so on. Hence the problem of overcrowding must be solved by dispersal, for which policy there is, of course, a good deal of official support.

Glasgow's rehousing problem is perhaps more serious than that of any other authority in the country. In the obsolescent central areas the density of development is extremely high on account of the predominance of tenements, and many of these are seriously overcrowded. At the same time Glasgow's site sets narrow physical limits to the amount of land available for development around the fringes of the city on which main reliance has been placed hitherto. During the next twenty years the Corporation is planning to rehouse some 100,000 families from the central areas which are to be redeveloped. If these plans are carried out at the levels of density proposed they will create an overspill of at least 200,000 persons.

This book is concerned with Glasgow's redevelopment policy and its implications. The author, a practised urban sociologist, is already known for a number of notable studies of the Midlands and South Wales. The core of the book consists of an unexceptionable economic and social survey of Govan, one of the areas scheduled for redevelopment. Also included is much information of a similar character on Pollok, one of the city's suburban housing estates which has drawn much of its population from Govan. The emphasis is on the old area, as the new one forms the subject of a separate study.

These surveys are used as a basis for an interesting study of the ways in which the criteria used for rehousing have influenced the economic and social structure of the two areas. They also enable the author to draw attention to a number of difficulties which may be produced when the rehousing problem is considered overnarrowly and is regarded simply as a matter of providing houses. One interesting fact to emerge from the surveys is that the density of occupation in the overcrowded central area examined is now lower than in the new estate.

The book thus represents a useful study of the administration of a housing policy. It is, however, also offered as a critique of Glasgow's over-

spill and dispersal policy, and here it is less satisfactory. Arguing from the facts he has disclosed concerning the density of occupation in the central areas, Brennan suggests the rehabilitation of some of these areas as an alternative to be preferred to their comprehensive redevelopment. This suggestion is supported by an analysis of the relatively small changes in land use which will occur in the central areas if the plans are carried out. Brennan's proposal would, among other things, reduce the magnitude of the overspill, and it merits attention. But its justification must inevitably depend on considerations ranging beyond the factors emphasised by the author and which receive no adequate discussion in the book. One does not get a very clear picture of the plans for rehousing and dispersal which are the subject of criticism, and for this reason the book might well be read with the Corporation's own publication *Industry on the Move*, to which Brennan's study provides a useful corrective.

Whether Glasgow's overspill problem will be at all easily solved on the lines officially laid down is certainly open to doubt, and Mr. Brennan's reservations seem well founded. One major obstacle is, of course, that its solution evidently calls for a dispersal of industry parallel to that of population. Yet Glasgow, unlike other cities confronting a similar problem, is not a growth centre which naturally attracts the kinds of industry which might facilitate this dispersal. One or two more recent developments, such as the city's overspill agreement with the new town of Glenrothes and the new measures for dealing with local unemployment, may help to make the whole matter a little less formidable than it was when this book was written, but the problem remains a major one.

PETER ROBSON

Cambridge.

The Social Evolution of Industrial Britain. By L. G. JOHNSON. (Liverpool: Liverpool University Press, 1959. Pp. 178. 25*s.*)

IT is difficult to know what to say about Mr. Johnson's book, because it is difficult to see what he is driving at. The book seems to be a series of reflective essays, loosely connected by rough chronological succession, about the "integration" of the working class in modern British society. The precise meaning of the term "integration" is by no means clear, as witness such a sentence as "recurrent unemployment showed how loosely integrated society was" (p. 81). Similar difficulties beset us in the understanding of another of Mr. Johnson's key words, "creative." (*E.g.*, "For, as the years moved on, it became clear that working people would have to adjust themselves to technological progress, which meant neither more nor less than adjusting themselves to themselves as the creators of a new material civilisation and to themselves as the citizens of a nation with a past as well as a future. This task offered unique scope for creative action within the

nation," p. 80.) What he seems to mean is: (*a*) that the working-class did not become revolutionary, but reformist, and (*b*) that in one way or another individual workers and working-class organisations contributed much to the technical skills and the political development of nineteenth-century Britain.

Both these statements (if they correctly represent the author) are unexceptionable, though they hardly provide an adequate analytical framework likely to interest the economist or the sociologist, and Mr. Johnson's discussion of the problems they incidentally raise will not be of much relevance to the historian. This is partly due to Mr. Johnson's total lack of interest in, or awareness of, what economists and sociologists are thinking about—he appears on at least two occasions to imply that economic fluctuations are capricious—partly to his curious chronological pace, partly to his odd use of terminology. (Is it really useful to describe the sentiments of the Chartists as "feudal"—pp. 45–6?). There are also pages where this reviewer at least is unable to follow the author's train of thought at all.

Though Mr. Johnson is widely read in the publications of the first half of the century, the book is not well documented. Such scattered quantitative statements about economic development as are made are mostly taken from contemporary secondary sources. There is little reference to the works of modern scholars in the relevant fields, and some internal evidence that the book was written several years ago, but not adequately brought up-to-date. It may safely be said that practically no problem of the social evolution of industrial Britain, as the term would be understood by most economists, sociologists and historians at present, is discussed.

E. J. HOBSBAWM

Birkbeck College,
London.

An Economic Survey of the Sisal Industry of Tanganyika. By C. W. GUILLEBAUD. (Welwyn: Nisbet and the Tanganyika Sisal Growers' Association, 1959. Pp. xiii + 119. 15*s*.)

THIS is a model monograph on an industry on which little has hitherto been known except to those engaged in it and, as Mr. Rowe points out in an Introduction, it is the first up-to-date and comprehensive survey of any of the hard-fibre industries. The idea of the survey was conceived by the Tanganyika Sisal Growers' Association under the leadership of the late Sir Eldred Hitchcock, but the volume which is now available is of interest to many who have no stake in the industry's fortunes. Many surveys are little more than descriptions of the industries with which they deal, but in this case Mr. Guillebaud has provided not merely an adequate account of the sisal industry of Tanganyika as it now is and as it has grown to its present position; he has also given an excellent analysis of its major problems.

The sisal industry of Tanganyika was started in 1892 when a German introduced a few sisal plants from Florida. The period of rapid expansion

started in 1923 when the output was 12,800 tons; in 1956 it was 185,600 tons. The estates are of mixed nationality. About a third of the output comes from Greek estates, with British-owned estates a close second, followed by estates of Asian, Swiss, Dutch, Italian and German ownership, in addition to which there is a small amount of African random sisal. Tanganyika now takes first place among the sisal-producing countries and provides about a third of the world's output. In terms of employment, although only about 5% of the African population in Tanganyika work for wages, including domestic service, nearly a third of the paid labour is employed in the sisal industry. In 1956 about a quarter of the country's exports came from sisal, and a considerable proportion of the country's tax revenue came directly or indirectly from the industry. Hence the importance of the industry to Tanganyika's economy.

The demand for sisal is very inelastic, mainly because the price of sisal enters so little into the costs of the sisal-using industries. The supply of sisal is also very inelastic in the short period, partly because the life cycle of the crop is from eight to twelve years but partly also because the crop is generally grown on land which is not suited to other forms of production. Variations in supply under these conditions can produce violent price fluctuations, and this has in fact been one of the industry's major problems, made even more difficult since the holding of stocks has not been the general practice. The possibility of weak-selling is a further complicating factor.

On the marketing side certain changes have occurred as a by-product of war conditions. Before the War most sisal growers disposed of their output through London finance houses, which in turn made use of merchanting firms to sell to the spinners, and the finance houses made advances to the growers against the ultimate sale of their sisal. The merchanting firms sometimes made advances to spinners, but in general they were unable to do more than act as brokers. In the holding of stocks they played little part, and Mr. Guillebaud is satisfied that their function was of little advantage to the growers.

During the War the disposal of sisal was subject to government bulk purchase arrangements. Since then most of the growers, representing about half of the output, became members of a voluntary Tanganyika Sisal Marketing Association which, by making monthly advances against production, performs a function similar to that previously performed by the finance houses. Many of the members of this Association are the smaller and weaker estates, and to this extent the Association may do something to reduce the influence of weak-selling tendencies. Mr. Guillebaud records his opinion, which seems to be well founded, that " the sisal market is probably too limited to permit the creation of a viable futures market."

In the matter of labour relations the industry has now evolved an elaborate system of joint consultation, with estate committees, regional councils and a central council. The preparation of this scheme was largely the work of

Mr. Guillebaud, though he does not say so, and there is evidence that despite a number of initial teething troubles, largely bound up with questions of union recognition, the scheme will play an important part in the country's structure of industrial relations.

Mr. Guillebaud is to be congratulated for producing so excellent a monograph.

D. T. JACK

University of Durham,
Newcastle upon Tyne.

Forty Years of Foreign Trade: A Statistical Handbook with special reference to Primary Products and Under-developed Countries. By P. LAMARTINE YATES. (London: George Allen & Unwin, 1959. Pp. 255. 40*s*.)

THIS book is an important contribution to our knowledge of the trends in world trade during the first half of this century. Mr. Yates had originally set out with the intention of studying the economic policies of the more important under-developed countries in order to ascertain whether their policies, taken collectively, might have a significant influence on the character of international trade (p. 18), but found his purpose frustrated by the absence of detailed, comparable and comprehensive statistics of world trade. Consequently, he has devoted his effort to the collection of basic statistical data to fill the gap.

In this more restricted field Mr. Yates has covered a remarkable amount of ground, met most of his difficulties with ingenuity, raised a good number of important questions of policy and yet has produced an interesting and readable text. The statistical framework consists essentially of a detailed comparison of world trade in 1913 and 1953. For in 1913, the author has analysed the foreign trade of practically every important trading country into a large number of commodity groups, and this in itself must have been a major undertaking. For 1953, he used the United Nations' tabulations. He has also managed to "splice" into his series the figures for 1929 and 1937 published by the German Statistisches Reichsamt.

The book is concerned with three main themes: the trends in world trade as a whole and in the two main subdivisions, manufactures and primary products; the trends for each main primary product; and the trends in the trade of the principal countries. The long-term trends in world trade as a whole have already been analysed by F. Hilgerdt in 1945 and Professor W. A. Lewis in 1952. Mr. Yates' new series adds little here, except that he has a useful comparison of the 1953 situation with 1937 and 1913, excluding the present countries of the Soviet bloc. The point is of substantial importance in assessing the trends in trade in primary products and manufactures. Professor Lewis had remarked on the effective stability of the proportion of primary products in total world trade and had even taken this proportion as a constant in one of his equations. Yates shows that if

the present Soviet countries are excluded, the proportion fell from 62% in 1913 to 58·5 in 1938 and 56·1 in 1953.

The new material for 1913 is deployed with good effect in the analysis of changes in the area pattern of trade since that date in primary products and manufactures (Chapter 3). This is the first time that trends in *imports* in these major classes of goods have been analysed for each of the main under-developed areas, and a good deal of the export analysis is also new. On the import side, Mr. Yates shows that—again excluding the Soviet area—the volume of imports of manufactures in 1953 was substantially greater than in 1913 for all the main areas, with one exception: the British Isles, where there was a fall of over 10%. This abnormal development in British imports deserves further study; Mr. Yates by-passes it with the remark that Britain was never a significant importer of manufactures (p. 48), though she took 9% of world imports in this class in 1913, excluding the present Soviet countries, and 16% of imports into North America and Europe.

The chapters dealing with individual primary products, about half the book in length, are generally of a high standard. The analysis revolves round the trend in trade values, unit values and quantum indices, a more valuable approach than the usual one based on tonnage or other quantity units. That Mr. Yates has a mind for policy issues as well as for statistical methodology is apparent. In nearly all these commodity sections he raises questions of policy which clearly could not adequately be discussed within the compass of the present book. For example, will India attain self-sufficiency in rice? why have tea prices been relatively stable while coffee and cocoa prices oscillate violently? what are the long-term demand prospects for this, that and the other commodity? These and numerous similar queries may well irritate some readers, but if, in others, he has stimulated critical thought on what are, after all, vital policy issues for the primary-producing countries, Mr. Yates should be well content.

The final section, dealing with the fortunes of individual countries in foreign trade, contains much that is new and interesting. In 1913, for instance, there were twenty-two primary-producing countries which obtained more than half their export receipts from a single product; by 1953, eight of these had become diversified, but another sixteen entered the group of "one-commodity exporters," making thirty in all. All together, these thirty "exposed" countries account for nearly 40% of the exports of Africa, Asia and Latin America. Apart from a few countries, such as the petroleum exporters, most primary-producing countries are just as vulnerable to shifts in world demand to-day as they were in 1913. This is an important conclusion and underlines recent discussion concerning commodity "stabilisation" schemes. This last section also contains useful information on the commodity pattern of imports in 1913 and 1953 for a large number of countries, both industrial and under-developed.

Several points need to be borne in mind as regards the statistical pre-

sentation. The first is that no adjustments have been made for boundary changes between 1913 and 1953. This particularly affects the figures for Germany, and Mr. Yates meets the problem by submerging the German figures into a miscellaneous group of European countries. However, it might have been more useful for some purposes to have compared the 1953 figures for West Germany with even an approximate estimate for the pre-war trade of the present area of that country.

The second point is that Mr. Yates has presented all his main results in terms of volume as well as value. This is a particularly difficult operation for manufactured goods, and the results are clearly subject to a considerable margin of error. This Mr. Yates recognises, and the risk taken was a conscious one. For reaching broad conclusions about relative volume movements, the resulting figures at " constant " prices may not be very misleading. Unfortunately, the author has not done quite as well as was possible, since he uses Kindleberger's unit value index for Industrial Europe as a whole to deflate the exports of individual countries, even though the corresponding indices for each main European country were available in Professor Kindleberger's book. This leads to some odd results, as, for instance, when comparing the growth in the value (at constant prices) of exports of manufactures from different countries between 1913 and 1953 (p. 173); here one finds that the growth in the Canadian total in this period is given as three times that in the British. Had the respective national unit value indices been used, the differential in Canada's favour would have been substantially smaller.

Other points which might ensnare the unwary reader are the inclusion of " special category " exports from the United States in 1953 (these are essentially military aid and are normally excluded from international comparisons), and the inclusion in the 1913 figures of the Netherlands export totals, in spite of the author's explanation that these were based on inflated price lists and were inclusive of a substantial amount of transit trade. The technical discussion in the Appendix is likely to become standard reading for students and research workers in this field.

A. MAIZELS

National Institute of Economic and Social Research, London.

The Economic Development of Communist China, 1949–1958. By T. J. HUGHES and D. E. T. LUARD. (London: Oxford University Press for the Royal Institute of International Affairs, 1959. Pp. viii + 223. 22*s.* 6*d.*)

THIS is a valuable book. Of all the dramatic passages in contemporary economic history, none equals in interest and importance the first ten years of development in New China. Since it excites violent prejudices, every witness is suspected of wishful thinking one way or the other. It is for this

reason that a cool, objective, documented account of the story is much to be welcomed.

Prejudice shows itself in adjectives. (We are resolute; they are ruthless. We are enlightened; they are doctrinaire.) By this test the authors are more anti than pro, but they are sparing of adjectives and do their best to let facts speak for themselves; in any case, this bias is a fault on the right side, for an extraordinary tale gains credence when the teller has evidently no preconceived desire to believe it.

The authors tell us that they have taken their material almost entirely from Chinese official publications, and that they have nothing but their own judgment to rely upon to evaluate it. They make use not only of the statistics of programmes and achievements but also of the many exhortations and criticisms of " bad work " that the authorities are continually issuing; from these and other hints they construct a picture of economic policy evolving through successive phases—the initial restoration of order, the quelling of inflation and initiation of the land reform; the inauguration of the first Five Year Plan; the " high tide " of 1956, when the bulk of agriculture was brought into co-operatives and the process of digesting private trade into the state system carried to the half-way stage of " joint state–private enterprise "; the pause in 1957 and the " great leap " of 1958.

Even upon cautious estimates, the rate of growth of industrial capacity is probably the most rapid the world has ever known, but this is only a matter of degree. There are three respects in which Chinese experience appears to differ radically from that of other nations. First, the transition in the space of ten years (except in the " old liberated areas " where experiments were carried out over a long period) from a harsh form of feudalism, through peasant proprietorship, to co-operative farming with an intermingling of industrial and agricultural production. Second, the organisation of labour, working almost literally " with bare hands," over the whole country, to produce capital works, such as the river-control schemes, and social investment, such as the famous annihilation of flies. Third, the absorption by the revolution of the great bulk not only of the old feudal and professional classes but also the mass of small traders.

The witness of this book, brief, factual and deliberately dry, will help to compel acceptance of the story, however improbable it may appear.

JOAN ROBINSON

Cambridge.

Germany's Economic Preparation for War. By B. H. KLEIN. (Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1959. Pp. xi + 272. 40*s.*)

THIS is a surprising book. The author is a German, apparently long resident in the United States. The material on which the book is based is derived from the United States Strategic Bombing Survey and from a variety

of official German data recently made available, including memoranda written by German generals and other German V.I.P.s for the Allied Control Commission after the War.

The book purports to be a major debunking operation. According to the author, Germany's preparations for war from 1933 to 1938 were on a much less massive scale, and much less efficiently conducted, than has been generally believed, while the handling of the German War Economy from 1939 to 1944 was also, from the point of view of efficiency, a mediocre performance, falling far short of the high standards commonly attributed to it by non-German commentators.

In particular, the author maintains that in the pre-war period the fear of inflation—Schacht seems to have been obsessed by this—severely slowed down the rearmament programme. Deficit financing was viewed with great apprehension in high places; the raw-material programme was patchy and half-hearted; and so was the mobilisation of man-power.

Nor, after 1939, does the author consider that the Germans came anywhere near achieving an all-out war effort comparable to that of Britain or, in some important respects, of the United States.

Evidence is offered in support of all these conclusions. It is, of course, impossible for a reviewer of this book to check up all this evidence and reassess its value. I can only say that, if these conclusions had come to me through British intelligence reports in 1940–42 when I was Minister of Economic Warfare, or earlier when, though not yet a Minister, I was making a pretty close study of German rearmament, I should have disbelieved most of them. Here, by way of illustration, are just a few of Mr. Klein's surprising statements.

(1) At the beginning of the war, in 1939, British and German aircraft production were about equal, and British tank production exceeded German; German " output of combat aircraft was only sixty per cent of the production rate credited to Germany by British intelligence " (p. 19).

(2) " In the pre-war period Germany produced both ' butter ' and ' guns,' much more of the former and much less of the latter than has been commonly assumed. By 1937 German civilian consumption, investment in consumer goods industries and Government non-war expenditures equalled or exceeded previous peak levels " (p. 76).

(3) " In January 1941 Hitler ordered preparations to be made for an attack on Russia. The scale of this was quite modest and entirely consistent with the idea that the conquest of Russia required no more than a blitzkrieg " (p. 189).

The controversies opened up by this book can only, I think, be carried further by a confrontation of rival economic war historians, each soaked in his own national detail.

DALTON

London.

NOTES AND MEMORANDA

HOW LONG IS THE LONG RUN?[1]

In the theory of the firm, the long run is normally conceived not as a fixed time period, but rather as a time period long enough to permit all necessary adjustments required to attain any given level of output. The long-run cost curve is supposedly made up of the various possible plant curves through the ranges of output from the intersection of each plant curve with the one preceding and the one following. It is a curve where the various possible methods of organisation of factors are all given. Other things remaining equal, any point on it can be reached *given sufficient time*. Static theory requires no more than this. Of course, other things *must* remain equal, and this includes technological development.

But something began to trouble me about this definition nearly as soon as I thought about it seriously. Does this long-run cost curve include in its definition an allowance for *expected* technological development, and a risk allowance for " surprises " which can be guessed at with some accuracy? How long would it take to get the new developments into the operative stage? Is a point far out on the curve realisable in the time it takes to build the required plant? How fast can the firm expand, if it is already in existence, and how soon could a firm produce at some selected output if it starts fresh?

Not being able to decide just what the long run was after raising these questions, I went back to Viner to see if he had tightened up Marshall's definition. He repeats Marshall's notion: ". . . a period long enough to permit each producer to make such technologically possible changes in the scale of his plant as he desires." [2] And he adds:

> " The theoretical static long-run . . . is a sort of ' timeless ' long-run throughout which nothing new happens except the full mutual adjustment to each other of the primary factors existing at the beginning of the long-run period. It is more correct, therefore, to speak of the long-run equilibrium in terms of the conditions which will prevail after a long-run rather than during a long-run." [3]

This way of looking at the long-run seems to exclude the notion that the long-run cost curve is a *planning* curve for the individual firm. Predictable changes in the famous (or infamous) *ceteris paribus* do occur in firms, and other changes are often quantified in risk allowances in long-run

[1] I wish to express my gratitude to the Social Science Research Council for making possible my work on this and related subjects in the theory of the firm.

[2] " Cost Curves and Supply Curves," *Zeitschrift für Nationalökonomie* (1931), reprinted in *Readings in Price Theory*, p. 205.

[3] *Ibid.*, p. 206.

planning. Plans on the drawing-board but not available for production for two years are compared with plans on the board not available for five years. New substitutes which are expected from suppliers in the next year may be integrated into next year's production plan. The trend of "surprises" which have been occurring at fairly regular intervals over the past few years can be projected into the future. Taking these planning problems into account, the long-run cost curve would have to be redefined if it were to be thought of as a *planning* curve. A point at output x would have to be defined according to how long the firm was willing to wait.

That firms would take time to reach various positions on the long-run cost curve is not a new idea. It was implicit in Marshall's definition, and it has been taken up by Shove, Robertson, Andrews and Harrod [1] as an explanation of why some firms faced with long-run decreasing costs in competitive industries did not just leap ahead and capture the whole of their markets. For some reason this point never achieved its just position as an important explanation of firm behaviour in the presence of long-run decreasing costs. Perhaps this is so because no one has taken the pains to point out explicitly that every point on the Marshallian long-run curve has minimum date attached to it. Furthermore, that date will usually be different for each point.

From this stand one might take one further step and say that the rate of growth of output on the long-run curve is limited. This proposal was made by Penrose in theoretical terms.[2] The argument is that the capacity to reorganise and assimilate new factors is limited in any one period of time. Empirically there seems to be justification for the idea that growth rates are limited.[3]

Harrod seems to have struck this stone in his recent attempt to clear up some of the excess capacity muddle.[4] As a result, he suggested that the long-run cost curve should be defined to include only those returns realisable as soon as additional plant is constructed and labour recruited. At first glance this may look the same as the usual interpretation. One might think that the "all necessary adjustments" condition would handle this. But a careful consideration of his suggestion reveals some things which upset the usual convenient qualification. Change takes time, as has been shown. A plant already in existence has a number of commitments which can be changed only over a long period without entailing excessive cost increments. Labour has to be reassigned and retrained, machines have to be rearranged,

[1] Shove's essay in "Increasing Returns and the Representative Firm," a symposium in this journal, 1930; D. H. Robertson, *e.g.*, in *Economic Commentaries*, p. 23; P. W. S. Andrews, "Industrial Analysis in Economics," *Oxford Studies in the Price Mechanism*, p. 162; R. F. Harrod, "The Theory of Imperfect Competition Revised," *Economic Essays*, p. 184.

[2] E. T. Penrose, "Limits to the Size and Growth of Firms," *American Economic Review*, Supplement, May 1955.

[3] Cf. M. K. Wood, "Representation in a Linear Model of Non-linear Growth Curves in the Aircraft Industry," in Koopmans, *Activity Analysis of Production and Allocation* (1951).

[4] "Theory of Imperfect Competition Revised."

buildings have to be altered or destroyed and others built. Even the firm starting out fresh can choose between plants capable of almost immediate production (perhaps in existing plants sold by other industries) and others capable of production only after a definite delay or waiting period. Harrod asked that the curve be limited to outcomes *immediately realisable* as soon as the physical process of acquiring and organising the factors was finished.

This seems too strict if expected developments are to be considered side by side with currently feasible possibilities. I suggest that we go a little further than Harrod. One long-run cost curve, or planning curve, or whatever you want to call it, ought to be defined in the Harrod sense. But there ought to be a set of other, longer-run, planning curves which take into account the expected changes and the " surprise " projections mentioned earlier. For each date in the future for which a business-man wishes to

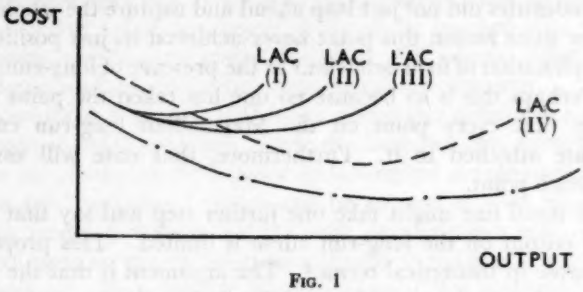

FIG. 1

make a plan a different long-run cost curve applies. In Fig. 1, LAC (Long-run Average Cost) (I) represents the Harrodian long-run. LAC (II) may be the envelope of possible plants in two years time, LAC (III) in three years time, and so on. Some of the LAC curves may lie wholly under the earlier period curves, as in the case of LAC (V). Moreover, on the Harrodian curve each position has a date attached to it also. The Harrodian long-run curve is made up of a series of levels of output, each of which are attainable at some date in the near future, say less than one year, depending on the gestation period and the possible rate of growth. But movements from one plant to another on the Harrodian curve may take different lengths of time up to one year, depending upon how far along the envelope one planned to go from one's initial position.

It could now be proposed that there are an infinite number of LAC curves as I defined them, and this would be correct. In actual planning the business-man may chart curves (at least roughly) for distinct periods, as in the figure, in order to simplify the decision process and in order to provide only a few curves about which information has to be provided. As far as static economic theory is concerned, this is all to the good. Each possible decision period takes on the form of ordinary static theory periods, and a period decision model is provided.

This restatement, if accepted, leads to all sorts of conclusions about possible and planned growth rates of firms, linearity of empirical cost curves, decision variables for maximising profits in a changing environment and so on.

H. B. MALMGREN

Nuffield College,
Oxford.

THE "ECONOMIC EFFICIENCY" OF TAXATION: A NOTE[1]

IN a recent article Dr. A. Morag [2] had focused attention on a particular aspect of economic efficiency in taxation. The purpose of this note is to comment on some of the ideas involved.

The starting point of Morag's argument is that if two taxes are similar in all respects except that tax A requires a larger money yield than tax B, then tax B can be defined as more efficient than tax A. This proposition is developed by a comparison between the requirements, from a fiscal policy view-point, of yields under a general sales or expenditure tax, on the one hand, and a personal income tax, on the other. As the former will have substitution effects encouraging more saving than the latter, a lower-yield expenditure tax will have just as strong an anti-inflationary effect as a higher-yield income tax. Therefore it will follow that in the former case the Government can finance a larger proportion of any given level of public expenditure by issuing stock or creating credit. The final link in the chain of reasoning is the assertion that the private sector derives a measure of utility from holding these larger liquid balances.

The first point we shall take up is the linkage between tax-yield requirements and the incurring of a deficit. The second will be to examine the likely size of the permissible annual deficit in the expenditure-tax/income-tax comparison after allowing for all the complications. The third will be to inquire into the advantages and disadvantages of larger private holdings of cash or Government debt. The fourth will be to make a brief observation on the logic of the approach.

It can easily be seen that if tax B does not necessitate as high a money yield as tax A, it is a *non-sequitur* to argue that the Government deficit *must* be greater in the former case. Consider the choice between a general consumption tax and an excise tax on X, the product the Government wishes to buy with its tax revenue. It can then be shown [3] that under certain assumptions—and particularly that of production under conditions of increasing costs—the general tax will necessitate a larger absolute yield in money terms and a larger ratio of yield to national income at factor cost than the partial

[1] I am indebted to Mr. M. J. Farrell for helpful comments on an earlier draft of this note.

[2] A. Morag, "Is the 'Economic Efficiency' of Taxation Important?" ECONOMIC JOURNAL, March 1959.

[3] Cf. R. A. Musgrave, *The Theory of Public Finance* (McGraw Hill, New York, 1959), pp. 155–7.

tax.[1] However, it does *not* follow that the private sector is left holding more Government debt or cash in the partial-tax case.[2] It is precisely because the Government has to pay a higher price (net of tax) for X in the general tax case that it then needs to collect more revenue. The proposition that tax B necessitates a smaller money yield than tax A is a necessary but not a sufficient condition for the private sector to acquire more liquid assets in the tax B than in the tax A case.

It must therefore be concluded that there is no identity between tax efficiency in the sense of minimising the ratio of tax to national income at factor cost and in the sense of maximising the excess of Government expenditure over Government revenue. If one compares two taxes with differential substitution effects on saving, such as an expenditure tax and an income tax, the two things may come together. But they will not do so in all circumstances.

Let us now concentrate on the comparison with which Morag is principally concerned, *i.e.*, that between an expenditure or general sales tax and an income tax. His main reason for arguing that a smaller yield will suffice in the former case to secure any given degree of restriction is the substitution effect on personal saving. Only brief reference is made to two other supporting arguments which are sometimes made: that a general sales tax is likely to strike more at lower-income groups and less at upper-income groups than a personal income tax and that money illusion may also lead to greater expenditure restraint in the sales-tax case. As, however, the same author has expressed reservations about these arguments in another context,[3] he would presumably not wish to rely heavily on them here. We can therefore simply ask, first, how much weight can be placed on the substitution effect and, secondly, what further considerations have to be borne in mind in estimating the likely increase in the holdings of Government debt and cash by the private sector.

The additional inducement to save if the tax base is changed from income to consumption has been the subject of some discussion in recent years,[4] and it would seem that the relevant elasticity can take a series of possible values depending on the rate of interest, relative tax rates, the length of time for which it is intended to save any particular sum and whether the change of tax base is temporary or permanent. Therefore the " primary " position

[1] How much larger depends on whether the balanced budget multiplier is deemed to be operating.

[2] Nor does it follow that the partial tax is more efficient in the sense of minimising excess burdens. The reverse is, in fact, the case, as the very success of the partial tax in minimising yield requirements is due to the stronger substitution effects and the greater loss of surplus than in the general tax case (cf. Musgrave, *loc. cit.*).

[3] " Deflationary Effects of Outlay and Income Taxes," *Journal of Political Economy*, June 1959.

[4] Cf. N. Kaldor *An Expenditure Tax* (Allen and Unwin, London, 1955); Musgrave, *op. cit.*, Chapter 12; A. R. Prest, " The Expenditure Tax and Saving," ECONOMIC JOURNAL, September 1959.

may or may not be one in which the sum collected in tax can be considerably reduced as a result of the change in tax base, without adding to inflationary pressure. Let us suppose that it can. Is this the end of the story? Obviously not, as we now have to ask how private consumption and investment are likely to be affected as a result of the annual change in the stock of Government securities and/or cash. These "secondary" effects are not considered at all by Morag.

There is an extensive literature on these matters, some of it very recent,[1] and it would be otiose to repeat all the arguments here. But as far as private investment is concerned, one has to ask whether expected returns or interest rates are likely to differ in the two situations. The method of financing the Government deficits (credit creation will tend to keep interest rates lower than debt issues) and the importance of the availability of funds of one's own (*e.g.*, is private investment more likely if people are left with liquid balances than if taxation siphons them off?) are perhaps the main headings to be considered. On the consumption side, one has to know the extent to which the money value of assets increases (partly a function of the *size* and partly of the *method* of Government deficits) and the effects of any given increase on consumption spending. Finally, one must not forget the linkages between investment and consumption; whether for instance, accelerator effects of the latter would promote investment even if wealth effects did not. The most likely guess about all these secondary effects is that they would increase spending, and that therefore the annual gap in tax yield could not be as high as considerations of primary issues alone would allow. But whatever the precise result, there is no excuse for leaving secondary effects out of consideration altogether.

If as a result of this analysis we arrive at the permissible budget deficits in the consumption-tax case, what are the advantages for the community of this state of affairs? We are now at the heart of Morag's argument, and so it deserves our closest attention.

Morag [2] argues "utilities of individuals are not derived only from real resources," "money gives utility for individuals . . . because it can be held," "money reserves provide security against financial embarrassment." One can agree that there is something in these statements, but one must also say straightaway that any comprehensive analysis must range much further. The heads of the arguments can be listed as follows. The advantages of greater liquid assets will be expressible partly in monetary terms and partly in non-monetary—security, reserve power and so on. The importance of these gains will depend on such factors as the existing ratio of assets to total income, the distribution of assets by income groups and other possibilities of

[1] J. E. Meade, "Is the National Debt a Burden?" *Oxford Economic Papers*, July 1958 and February 1959. J. M. Buchanan, *The Public Principles of Public Debt* (Irwin, Homewood, Illinois, 1958).

[2] *Op. cit.*, p. 92.

improving the capital market so as to make personal borrowing easier. The possible disadvantages will be an increase in tax rates and greater administrative expenses. How much and how soon tax rates will rise is a complicated matter, depending on, *inter alia*, the method of financing the deficit, but it would seem inevitable that the rate of tax on current expenditure should eventually be greater than that corresponding to the tax rate on income which would be needed in the income-tax case.[1] If this be so, the whole question of incentives to work or to take risks must be looked at. As these matters have recently been explored elsewhere,[2] it is unnecessary to repeat the arguments here. The simple point is that work-output and/or risk-taking *may* be pushed farther away from the optimum in these circumstances. As far as administrative expenses are concerned, the relevant question is whether a system of more borrowing and a smaller tax yield will involve greater real public expenditure than one of less borrowing and a higher tax yield.[3] Obviously one cannot be dogmatic about the answer; but that is no excuse for not raising the matter.

To summarise this part of the argument, one simply cannot say that greater indebtedness of the public to the private sector is *necessarily* an advantage to the latter. Consequently, one cannot accept Morag's argument that the amount of such indebtedness is a fundamental test of the merits of a tax.

Finally, there is a point of logic in this approach which must be examined. If one is positing that two taxes should not have equal yields and that, as a consequence, in one case the volume of cash and/or national debt must be different from the other, it is simply not legitimate to claim that one can then compare the relative efficiency of two *taxes*. All that one can compare is the relative efficiency of one tax system and the set of associated monetary

[1] If $100x\%$ is the income-tax rate, $100e\%$ may be labelled the equivalent rate of expenditure tax where $e = \frac{x}{1-x}$. There are three reasons why the actual rate of expenditure tax may have to be greater than the equivalent rate, if deficits are financed by increases in National Debt. The primary substitution effects in favour of saving may be small in the expenditure-tax case, the secondary ("wealth") effects on spending may be important, and so may spending out of additional interest receipts. Even if the first reason were insufficiently strong to push the actual rate above the equivalent rate, the last two must do so sooner or later.

If deficits are financed entirely by credit creation the private sector suffers neither the advantages of higher interest receipts nor the disadvantages of higher tax payments to offset spending out of interest receipts. Nevertheless, one must still expect the ultimate expenditure-tax rate to be above the equivalent rate in order to offset the wealth effects, which will tend to be greater than in the Debt case.

It should be noted that there are no pronouncements about *absolute* tax rates in this analysis. We are concerned with the *relative* levels of income- and expenditure-tax rates.

[2] Prest, *op. cit.*

[3] The comparison of the relative administrative costs of expenditure and income taxes is of immense importance, but is not relevant here, as we are confining ourselves to Morag's question: the relative merits of two taxes similar in all respects except the money yield required to restrict private spending to a specified level.

conditions with another tax system and its associated monetary conditions. The " economic efficiency " of *taxation* is a misnomer.

A. R. PREST

Christ's College,
Cambridge.

THE SHARE OF WAGES IN NATIONAL INCOME AND THE TERMS OF TRADE: A REJOINDER

IN a Note in the December 1959 issue of this JOURNAL Mr. D. T. Healey presents statistics to show that in the period 1870–1957 no consistent association between short-run changes in the terms of trade and short-run changes in the share of wages in national income exists—thereby refuting a proposition that I had tentatively advanced in an earlier article.[1] Whilst I do not hold very firmly to the proposition advanced in this article—namely, that in the short run the share of wages and the terms of trade are inversely related—none the less, I do not think Mr. Healey's statistics successfully disprove it.

Mr. Healey agrees that an inverse correlation seems to exist in the period since 1939 (see his Chart I and the accompanying table), but he notes that there are three years when it does not hold. If, however, instead of using *Personal* Income as the basis for calculations of wage share, Mr. Healey had used home-produced *National* Income, adjusted for stock appreciation, he would have found that the correlation holds almost perfectly. The changes are given in the following table.

	% change in terms of trade	% change in the share of wages in national income.*
1946– 7	− 6·4	+7·4 †
1947– 8	− 1·7	+1·5 †
1948– 9	+ 0·8	−1·3
1949–50	− 6·8	+0·7
1950– 1	−11·2	−0·2
1951– 2	+ 7·2	−2·5
1952– 3	+ 7·8	−0·7
1953– 4	− 0·8	+0·2
1954– 5	− 1·7	+3·2
1955– 6	+ 2·5	−0·1
1956– 7	+ 2·5	−0·2

Sources: Terms of Trade: Healey, *op. cit.*
Wage Share: Calculations from Tables I and II, 1956 and 1958 Blue Books on National Income.
* Domestically produced National Income, adjusted for stock appreciation.
† Domestically produced National Income plus Depreciation, adjusted for stock appreciation.

Paradoxically, the only exception to the rule occurs in 1950–51, when the worsening in the terms was very severe. This might be due to the fact

[1] G. Maynard, " Inflation, the Terms of Trade, and the Share of Wages in National Income," ECONOMIC JOURNAL, December 1958.

that 1951 was a very transitional year: the terms of trade worsened sharply in the first six months, as against the end of 1950, but improved equally sharply in the last six months.

The question whether *Personal* Income or *National* Income should be used as the basis for wage-share calculations cannot be answered dogmatically: it presumably depends on the purpose one has in mind. But in estimating or using any "national" income concept it is customary to attempt to eliminate capital gains, and to compute all costs in real terms, that is, in terms of replacement rather than original value. In principle, at least, therefore, *stock appreciation* (which measures the extent to which the valuation of stocks used up in current production differs from current replacement cost) should be eliminated. When prices are rising the accounting charge of stocks used up tends to fall short of current replacement cost, so that business profits as computed in accounting records tend to be overstated. They, therefore, should be adjusted downwards by subtracting an estimate of stock appreciation. When prices are falling, of course, the opposite is true. The point is relevant here, since swings in foreign-trade prices, particularly in import prices, are a major cause of discrepancy between original and replacement values so far as stocks are concerned; so that in testing a possible association between foreign-trade prices and the share of wages in national income we must take care to eliminate the effect of the former on "accounting" business profits. No doubt in practice the estimation of stock appreciation is a difficult matter and is not likely to be accurate, but since the Central Statistical Office provides such estimates for the post-war period, they might as well be used.

However, so far as I am aware, estimates of stock appreciation are certainly not available for earlier years back to 1870, so that estimates of national income for these earlier years remain uncorrected. Whilst it may still be the case that no association between the terms of trade and the share of wages in national income would emerge, even if national-income figures could be corrected for stock appreciation, none the less, Mr. Healey has not shown that it would not or could not.

GEOFFREY MAYNARD

University College, Cardiff.

CURRENT TOPICS

THE Annual Meeting of the Royal Economic Society will he held at the London School of Economics on Thursday, July 7 at 5 p.m. After formal business, The Rt. Hon. Reginald Maudling, President of the Board of Trade, and Mr. A. C. L. Day will open a discussion on "Problems of European Trade and Relations."

THE editors wish to call attention to the following letter, which has appeared in a number of newspapers and periodicals:

"A CAMBRIDGE APPEAL

"*From Mr. George Rylands and others.*

"Sir,—Twenty-four years ago Maynard Keynes built a Theatre at Cambridge at his own expense and soon after presented it in Trust to the University and City. With next to no financial aid the Trustees have carried on his declared intention of making available to a large theatre-less region of England the five arts of drama, opera, ballet, music and film; securing West End products when feasible; welcoming visits from international touring companies and from various repertory companies; sponsoring special Trust productions for presentation in Cambridge and elsewhere; arranging symphony concerts, chamber music, and poetry and music recitals; providing training, experience and opportunity from time to time for the best amateur talent and promise, in acting, direction, music, design and stage management. The success of the Cinema, which the Trust also runs, has kept the Theatre barely solvent. But rising costs and the impact of television compel the Trustees to appeal for a capital endowment fund of £75,000 if standards are to be maintained and activities extended. The provincial theatre today is in a precarious state and there have been many casualties.

"We appeal on behalf of the Cambridge Trust not only to those who may wish to show their admiration and gratitude for Keynes' services at the Treasury and Bretton Woods during the War; not only to the countless friends and lovers of Cambridge throughout the world; but also to those who believe in the value of the living theatre as a cultural asset to be cherished more devotedly and generously in an age of rapid scientific and technical expansion.

"Donations should be sent to the Chairman, Cambridge Arts Theatre Trust. Forms of covenant are available on request.

Yours faithfully,

GEORGE RYLANDS, *Chairman*
WALLACE COLE, *Mayor of Cambridge* } *Trustees*
NOEL ANNAN, *Provost of King's College*
SYBIL THORNDIKE — R. A. BUTLER
NINETTE DE VALOIS — C. P. SNOW
MARGOT FONTEYN DE ARIAS — ROY HARROD
ADRIAN — PETER HALL"

P.O. Box 17, Cambridge.

The editors would wish to add a special appeal to readers of the ECONOMIC JOURNAL, of which Maynard Keynes was editor for 33 years, while contributing to the financial prosperity of the Royal Economic Society by managing its investments. As many of our readers know, Keynes devoted much time and energy to promoting the interests of the Arts, and took some pride in the link he provided in his own person between the business of material production and high cultural values. Of his many projects, the Cambridge

Arts Theatre was especially near his heart. He believed that, with the co-operation of King's College, the owner of the site, he had built a theatre which would carry on in perpetuity the best kind of productions, and that he had established a solid financial basis for the Trust, combining University and City representatives, to which he handed it over. The War and its aftermath produced developments in relation to the finance of theatrical ventures which he could not have foreseen before the War.

We believe that he would have been deeply distressed by the idea that the Theatre, to which he had devoted so much of his care, was falling into financial difficulties that might prejudice it in continuing the achievement of the aims for which he built it. While this may not be judged a proper object for the generosity of the Royal Economic Society itself, which is contributing to the memory of Keynes in other ways, it is hoped that economists who read the JOURNAL may like to express their gratitude to Keynes and their own sense of the importance of the fine arts, by making their own contributions.

R. F. H.
E. A. G. R.

THE British Association for the Advancement of Science will meet this year at Cardiff, August 31–September 7. The following speakers will address the Economics Section (F): Professor R. S. Sayers, Presidential Address, Monetary Institutions and Monetary Policy in Great Britain. The Usefulness of Research Techniques Developed Since the War: Mr. L. A. Dicks-Mireaux and Mr. A. Maizels, National Institute of Economic & Social Research; Mr. A. H. Hazlewood, Mr. Peter Vandome and Mr. T. P. Hill, University of Oxford Institute of Statistics; Mr. W. B. Reddaway and Mr. J. R. S. Revell, Department of Applied Economics, Cambridge; Professor A. W. Phillips, London School of Economics. Population: Professor D. V. Glass and Professor Brinley Thomas. Also Professor W. A. Lewis will contribute to a Symposium on World Food and Population.

Inquiries regarding accommodation and other arrangements for the meeting should be addressed to the British Association for the Advancement of Science, 18 Adam Street, Adelphi, London, W.C.2.

THE following have been admitted to Life Fellowship of the Society:

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Fee, R. M.
Ghandi, J. K.
Kosloff, I. R.
Leung Cho-Keung
Lloyd, C. L.
Mehra, K. M.
Moore, C. H.
Moss, R.
Walters, A. A.
Wright, J. F.
Zorraquin, F. J. L.

THE following have been admitted to Fellowship of the Society:

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Asher, B. H.
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Drogberger, W.
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Forner, Prof. C. F.
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No. 9, 1959. *Ensuring the Expansion of the Economy in 1960. On the Work of Technical-Economic Councils:* G. HNILIČKA. *Problems of the Size and Type of Housing:* V. SOVA. *The Use of Plastics in Engineering:* J. HLÍDEK and J. KOPECKÝ. *On Investment by Co-operative Farms in Slovakia:* J. PORVAZNÍK. *Planning Industrial Capacity in Czechoslovakia:* F. ŠALDA. *Unfinished Construction:* E. ČERVENÝ et al.

No. 10, 1959. *The Aims of the State Planning Commission:* O. ŠIMŮNEK. *New Measures in the Field of Planning and Price Formation:* J. TYPOLT. *Long-term Perspectives for Engineering:* Z. DRÁB and V. KOTLÁŘ. *Scrap Metal and Its Economic Importance:* O. MESÁROŠ and J. NOVOTNÝ. *The Economics of Livestock Albumen Production:* J. NOVÁK. *Technical and Economic Parameters for Investment Efficiency:* L. ŘÍHA. *The Use of Matrices in Foreign Trade Calculations:* V. KADLEC.

No. 11, 1959. *The Directives for the Third Five-year Plan—A Programme for the Development of an Advanced Socialist Society. The Methodology of Drafting the Third Five-year Plan:* V. HORÁLEK. *Current Problems of the Criteria of Material Incentives:* M. SOKOL. *Material Incentives to Advance Technical Progress:* V. KNOBLOCH et al. *The Control of Unfinished Construction:* E. ČERVENÝ et al. *Problems of Price Posed in Investigations into the Efficient Use of Resources:* V. KOMÁREK.

No. 12, 1959. *The Introduction of Second Shifts in More Plants—an Important Factor in the Further Expansion of Industry. Czechoslovakia's Contribution to Peaceful Competition Between the Two World Systems:* F. STRÁNSKÝ. *Perspectives of Fuel and Power Supplies for Household Use:* O. TADRA. *The Building Materials Industry in the Third Five-year Plan:* K. DVOŘÁK. *Changes in the Methods of Drafting the Five-year Finance Plans and the Plan for Production Costs:* J. LIBUS. *Questions Concerning the Simple Reproduction of Fixed Assets:* K. JOHANOVSKÝ. *The Turnover Tax as an Economic Instrument:* J. PĚNKAVA.

Ikonomicheska Misl (*Bulgarian text, French and Russian summaries*)

No. 7, 1959. *Ten Years of Building Socialism in China:* K. DOBREV. *The Attainments and Perspectives in Building a Socialist Economy in the Korean People's Democratic Republic:* KIM GWAN DIN. *Possibilities for Developing New Products in the Chemical Industry:* M. GERASIMOV and D. RUSCHEV. *Improve the Tariff System and Regularise the Wage System in Industry:* S. RADEV. *The Role of Consumer-good Demand in the Rational Application of Economic Laws:* I. VIDENOV. *The Situation in and the Development of Our Non-Ferrous Metallurgy:* A. BURLIEV.

No. 8, 1959. *Scope for the Full Utilisation of Factors of Production in the Extraction and Flotation of Mineral Ores:* I. BUNZAROV. *On Some Indicators of Economic Efficiency in Engineering:* S. KHRISTOV. *The Reorganisation of Our Machine-tractor Stations:* I. NONCHEV. *The Foreign Trade of Bulgaria with the Socialist Countries:* I. TUTEV. *The Organisation and Planning of Material–Technical Supplies Under the New System of Industrial Management:* N. CHOBANOV.

No. 9, 1959. *Automation and Its Economic Efficiency:* P. RUSKOVA. *On the Question of Technical Progress and Obsolescence in Our Industry:* Z. ZLANTANOV. *Research on the Location of Industry under the Third Five-year Plan:* M. ENEV. *Prospects for the Development of Industry in the Varna Region:* M. DEVEDZHIEV. *The Relationship Between Labour Remuneration in Co-operative Farms, Labour Productivity and Profitability:* D. KINOV. *Fifteen Years of Socialist Construction in Albania:* H. BARDI. *The Plans of Czechoslovakia in the World Economy:* J. VEIVODA.

Planovo Stopanstvo (*Bulgarian text*)

No. 5, 1959. *Decisive Steps in the Planned Construction of Communism. On Certain Problems in the Improvement of Material Incentives in Industry:* TS. PETROV. *For the Integrated Development of the Building Materials and Components Industry:* V. STALEV. *The Economic Effect Arising from the Improvement in Coal Quality and the Introduction of New Industrial Classifications:* K. BELCHEV and N. KOLEV. *On the Volume and Structure of Our Grain Production:* KH. KUNCHEV. *The Rational Use of Working Capital—an Important Factor in Improving the Financial Situation of Industrial Enterprises:* D. KHRISTOV. *On Some Questions of the Organisation and Remuneration of Labour in Instrument-making:* D. SHOPOV, L. MAIROV and S. DOSEV. *The Reorganisation and Improvement of the State Administration of Socialist Industry in the German Democratic Republic:* G. FRIEDRICH and R. YANAKIEV. *A Jubilee Session of the Higher Economic Institutes:* T. DINKOV.

No. 6, 1959. *Prospects for Developing the Urban Trade Network and the Introduction of Progressive Methods in Retailing:* G. GEORGIEV. *The Rise in the Needs for Foodstuffs of Animal Origin and Possibilities for Their Satisfaction:* KH. KUNCHEV. *On Cost Prices in the Dairy Farms of Collectives near Sofia:* G. SVINAROV. *On the Introduction of Certain Types of Containers:* T. TODOROV. *On the Index Number of Global Production of Industry:* E. DRAGANOV. *Attempts to Control and Plan Agricultural Development in Capitalist Countries Today:* G. TSVETKOV. *For the Further Expansion of Building:* I. R. and S. M. *The Common Market and Its Role in the Economics and Politics of Contemporary Imperialism:* V. GEORGIEVA. *A Symposium on Questions of Planning Scientific Research:* N. V.

Finansi i Kredit (*Bulgarian text*)

No. 9, 1959. *For Stricter State and Financial Discipline. How to Reduce the Cost of Construction:* I. POPOV. *For a Full Utilisation of Agricultural Techniques:* D. TSONEV and S. TOTEV. *On Some Principles of the Problem of Establishing Depreciation Charges and the Economic Use of*

Fixed Assets in a Socialist Industrial Enterprise: V. RANKOV. *The Strengthening and Development of the Financial and Monetary System of the Chinese People's Republic:* D. K. *Is the Dollar Stable?:* B. NIKOLAEV.

No. 10, 1959. *The Plenum of the Central Committee of the Bulgarian Communist Party on Construction Problems—New Impetus for the Realisation of the Economic Leap Forward. The Role of the Soviet Union in the Socialist Construction of the People's Republic of Bulgaria:* K. LAZAROV. *Some Problems in Strengthening the Revenues of Collective Farms:* M. PETROV. *The Extension of Monthly Advances and New Forms of Labour Remuneration in Collective Farms—an Important Stimulus for Raising Labour Activity in Co-operatives:* N. GUGOVSKI. *Financial Organs and the Control over Inventions, Rationalisations and Organisational–Technical Measures and Propositions for Changing Capital Construction Projects:* I. SHISHKOV. *The Essence and Functions of Savings Deposits Under Socialism:* A. KEK.

Ekonomski Pregled (Serbo-Croat text, English summaries)

No. 8–9, 1959. *Transformation of the Village and the Increase of Socially-owned Land through Renting and Buying Land from Peasants:* A. STARC. *Investments in Yugoslavia in the Inter-war Period:* I. VINSKI. *A Polish Input–Output Table:* J. WIERZBICKI.

Ekonomist (Serbo-Croat text, English summaries)

No. 3, 1959. *Three Basic Problems in the Theory of Development of Under-Developed Countries:* N. COBELJIĆ. *The Measurement of the Economic Efficiency of an Enterprise:* S. KUKOLEČA. *The Exchange Rate Problem in the Economic Development of Yugoslavia:* S. OBRADOVIĆ. *The Calculation of Replacement and Gross Investment when the Capacity Needed of Means of Production Is Known:* B. HORVAT. *Tractor and Animal Draught Power in Yugoslav Agriculture:* P. MARKOVIĆ.

Közgazdasági Szemle (Hungarian text, Russian and English summaries)

No. 8–9, 1959. *Some Economic Aspects of the Emulation Movement in Honour of the Party Congress:* GY. VARGA. *Notes on the Problem of the International Division of Labour:* GY. GÖNCÖL. *Some Organisational Problems of Industrial Management:* S. BALÁSZY and GY. VARGA. *Comparing Industrial Productivity on a World Scale:* Z. ROMÁN. *Development of the Collective-farm System in the Period of Transition to Communism:* L. CSETE. *Income Trimming and the Price System:* A. SCHMIDT. *Population, Manpower, Regional Concentration of Industry and the "Overcrowded" Capital:* J. KÓRÓDY and GY. BORA. *Some Problems of Intensive Farming on Co-operative Farms:* L. MARKÓ. *A Survey of the Independent Population in Large and Small Farms:* P. PILLIS. *The Development of Hungarian Writing on Economics, 1790–1848:* A. MÁTYÁS. *State Interference in Hungarian Agriculture during the Second World War:* M. SZUHAY.

No. 10, 1959. *The Second Five-year Plan:* I. HETÉNYI. *Some Theoretical Problems of the Struggle Against Revisionism:* Á. HAÁSZ. *Some Problems of the Development of Agricultural Production during the Period of the Second Five-year Plan:* I. DIMÉNY and GY. NAGY. *The International Comparison of Production Costs:* B. CSIKÓS-NAGY. *The "Quantitative" and the "Economic" Approach:* J. KORNAI. *Current Problems of Market Research in Farm-co-operative Trade:* E. KEMENES.

No. 11, 1959. *New Trends in Our Foreign Trade:* GY. KARÁDI. *Some Methodological Problems in Preparing the Five-year Plan for Engineering:* L. ZIMMERMANN. *Manpower for the Building Industry:* S. FONÁL and J. LÖKKÖS. *Procedures to Determine a Rational Scheme for the Transport and Refining of Sugar-beet:* GY. KONDOR. *New Sales Methods in Retail Trade:* L. SELMECI. *Some Problems of the Economic Development of the United States:* A. RÁBA. *The Discussion on Price Formation in The Soviet Union:* ZS. ESZE.

No. 12, 1959. *The Tasks of Economists in the Light of the VII Congress of the Hungarian Socialist Workers' Party:* M. AJTAI. *Some Problems of the International Comparison of Levels of Living:* E. JÁVORKA. *Problems of Price Determination in the Socialist World Market:* B. CSIKÓS-NAGY. *Trends in the Saving of Labour Embodied in Instruments of Production:* A. VOROBEVA. *The Magnitude and Sources of Investment in Producers' Co-operatives:* J. REISZ. *The Economics of Maize in Producers' Co-operatives and Private Farms:* F. VÁGI. *The Development of Consumers' Co-operatives in the German Democratic and Federal Republics:* S. POLGÁR. *Complex Mechanisation and Automation in Soviet Industry:* GY. SIMON. *Greetings to Academician E. Varga. A Scientific Conference on Problems of Labour Productivity:* S. B. and A. J.

No. 1, 1960. *Some Characteristics of Technical Progress in the Second Five-year Plan:* Á. Kiss. *On the Consolidation of Producers' Co-operatives:* J. Keserű. *Investment Efficiency and Proportionate Economic Development:* J. Szabó. *Some Problems of Commodity Supply and Retail Turnover during the Period of the Second Five-year Plan:* J. Sós. *On Socialist Commodity Relations:* R. Hoch. *István Hatvani and the Beginnings of Hungarian Economics:* R. Horváth. *Management of Industrial Branches as Enterprises:* T. Botka.

Statisztikai Szemle (Hungarian text, English and Russian summaries)

October 1959. *The 1959 Soviet Census of Population:* F. Gyulay. *The Development of the Hungarian Petroleum Industry:* L. Ormai. *Some Experiences of the Enumeration of Surplus Material Stocks:* K. Bognar and A. Szomjas. *The Reorganisation of State and Economic Management and the Tasks of the Statistical Services in Bulgaria:* S. Stanev. *A Comparison of the National Accounting Systems of Socialist and Capitalist Countries:* A. Mód. *The Importance of Average Distances Between Stations and Its Method of Computation in Railway Transport:* T. Halász. *The Activity of the Italian Central Statistical Office:* Z. Kenessy. *Laws and Decrees Relating to Hungarian Censuses:* E. Remetey. *Questions of the Production and Consumption of Wine and Beer:* J. Fáy.

November 1959. *Towards the Eighth Congress of the Hungarian Socialist Workers' Party:* J. Zala. *Hungarian Morphine Alkaloid Production and Some of Its Development Problems:* Gy. Herczog and I. Oros. *Fodder Production in 1955–58:* L. Nagy. *Problems of Retail Trade Statistics:* I. Pálos and M. Zafir. *The Definition and Trend of Some Important Indicators of Private Building Activity in 1958:* Gy. Lonti. *Index Numbers of Volume in Capitalist Countries:* L. Halabuk.

December 1959. *The Directives for Our Social and Economic Development. An Input–Output Table of the Hungarian Economy:* Z. Kenessey. *Some Infectious Children's Diseases in Hungary:* Z. Marton. *Current Problems of the Catering Network:* M. Zafir. *A Study Tour in the Institut National de la Statistique et des Etudes Economiques:* Gy. Cukor and O. Lukács. *The Development of the Book Trade:* E. Szabó. *Accident Statistics of the State Insurance Company:* I. Groó.

Probleme Economice (Rumanian text, English, French and Russian summaries)

No. 10, 1959. *The Glorious Way of the Communist Party of the Soviet Union:* Z. Brîncu. *The Upsurge of Socialist Industrialisation in the Chinese People's Republic:* A. Vijoli. *Ten Years of Successful Development of the Economy of the German Democratic Republic:* F. Macher. *On Obsolescence and Its Influence on Amortisation:* S. Zeigher. *Some Problems of Saving Material Resources:* I. Iticovici. *Development of Industrial Crops in Our Country:* C. Cojocaru. *The Plundering of the Oil of Under-developed Countries—a Source of Enormous Profits for the Monopolies:* I. Stoian. *Some Important Problems of Agriculture Debated at the Conference of the Representatives of Research Institutes of Socialist Countries. The Foundation of the Economic Sciences Society of the Rumanian People's Republic.*

No. 11, 1959. *A Fundamental Work of Scientific Socialism:* S. Emil. *The Law of Planned Proportionate Development of the Economy and Its Utilisation by Our People's Democratic State:* I. Stroia. *Development of the Heavy Industry of the U.S.S.R. During the Seven-year Plan:* A. Zamfir. *Problems of the Development of the Raw Materials Base for Light Industry:* M. Iarovici and C. Iacobovici. *The Economic Efficiency of Irrigation:* V. Baghinschi and N. Sirbu. *The Achievements of the People's Republic of Albania in Building Socialism:* Z. Lika. *Aspects of U.S. Capital Exports:* I. Vesa. *Conclusions of the Debate on the Method of Calculating Cost of Production in Collective Farms. The "Economic Bulletin for Europe" on the Economic Development of the Socialist Countries:* E. Bibiri.

Ekonomia Popullore (Albanian text)

No. 6, 1959. *Fifteen Years of the Rapid Development of the National Economy. Soviet Aid—the Decisive Factor for the Building of Socialism in Our Country:* H. Banja. *The Entire Activity of Popular Power is Permeated with Care for the Welfare of the Workers:* P. Dode. *Our Finance During Fifteen Years of Popular Power:* A. Verli. *Albanian Industry and Its Leading Role in the Development of the Economy:* V. Misja. *The Path of Fifteen Years in Agriculture:* A. Kallapodhi. *The Construction Carried Out during the Past Fifteen Years Has Transformed the Face of Our Country:* V. Pistoli. *Planning and Its Important Role in the Development of the Economy:* B. Bardhoshi.

NEW BOOKS

British

ANDERSON (N.). The Urban Community: a world perspective. London: Routledge & Kegan Paul, 1960 (New York: Holt, 1959). 9″. Pp. xv + 500. 35*s*.

[This is a general survey of the field of urban sociology. It brings together a great deal of information. A considerable proportion of the book is made of quotations from other writers and brief summaries of their findings. As such it may be regarded as a useful guide to the literature of the subject, though it is not arranged in such a way as to be attractive continuous reading and does not do much to dispel the suspicions common among economists as to the platitudinous character of some sociological work.]

BASTER (J.). The Introduction of Western Economic Institutions into the Middle East. A Chatham House Memorandum. London: Oxford University Press for the Royal Institute of International Affairs, 1960. 10″. Pp. 41. 4*s*. 6*d*.

[This is a posthumous work, containing two chapters of what was planned to be a book on its subject. These two chapters deal respectively with the internal and international difficulties of introducing western economic institutions and ideas to Middle Eastern conditions. In the first chapter the author discusses the ambiguities of the notion of private capitalist enterprise as a model for imitation and the difficulties relating to the supply of enterprise, capital, labour and natural resources that limit its applicability in the Middle East. The second chapter is concerned with the ideals of free international movement of goods and capital.]

BEVERIDGE (JANET). An Epic of Clare Market. The birth and early years of the London School of Economics. London: Bell, 1960. 9″. Pp. xiii + 98. 15*s*.

[To be reviewed.]

BEVERIDGE (LORD). The London School of Economics and its Problems, 1919–1937. London: Allen & Unwin, 1960. 9″. Pp. 138. 21*s*.

[To be reviewed.]

BRIGGS (A.) and SAVILLE (J.) (Eds.). Essays in Labour History, in memory of G. D. H. Cole. London: Macmillan, 1960. 9″. Pp. vii + 364. 42*s*.

[To be reviewed.]

CLEGG (H. A.). A New Approach to Industrial Democracy. Oxford: Blackwell for the Congress for Cultural Freedom, 1960. 9″. Pp. viii + 140. 18*s*. 6*d*.

[To be reviewed.]

CONAN (A. R.). Capital Imports into Sterling Countries. London: Macmillan, 1960. 9″. Pp. x + 107. 18*s*.

[To be reviewed.]

DEANE (PHYLLIS) (Ed.). Bibliography on Income and Wealth, Volume VII, 1955–56. London: Bowes & Bowes for the International Association for Research in Income and Wealth, 1960. 10″. Pp. 131. 37*s*. 6*d*.

[The latest publication in this useful series follows the general lines of its predecessors. It enumerates over a thousand classified and cross-indexed items with brief but informative annotations on each. The field of income and wealth is interpreted broadly to cover not only statistical contributions but also discussions of concepts and problems of national income policy. Separate correspondents had the responsibility for preparing and annotating the lists of items relating to each country.]

EVELY (R.) and LITTLE (I. M. D.). Concentration in British Industry. An empirical study of the structure of industrial production, 1935–51. London: Cambridge University Press for the National Institute of Economic and Social Research, 1960. 9½″. Pp. xvi + 357. 55*s*.

[To be reviewed.]

HUGHES (J. R. T.). Fluctuations in Trade, Industry, and Finance. A study of British economic development, 1850–1860. London: Oxford University Press, 1960. 9″. Pp. xviii + 344. 45*s*.

[To be reviewed.]

ILES (D. J.) and TUCKER (C. J.). Problems of Full Employment. London: Routledge & Kegan Paul, 1960. 7¼″. Pp. x + 265. 20*s*.

[This is designed for the general reader, with some eye also to the candidate for G.C.E. Advanced Level. It provides an introduction to the theory of income determination, and then goes on to discuss most of the other economic problems that have been experienced in Great Britain since the War. The deliberate emphasis on unemployment as the central problem gives the book a somewhat old-fashioned air in places, despite the large amount of up-to-date empirical material included. In some places, too, the link between the discussion of policy and the underlying economic principles is not made quite as clear as might be wished. None the less, much ground is covered in an informative way, and the authors have no axes to grind, so that their book may be added to the rather short list of reading suitable to recommend to prospective students of economics before they come to the university.]

INCE (SIR GODFREY). The Ministry of Labour and National Service. London: Allen & Unwin, 1960. 9″. Pp. 215. 25*s*.

[To be reviewed.]

An Introduction to Business Forecasting. London: The Institute of Cost and Works Accountants, 1960. (Distributed by Gee & Co., 27–28 Basinghall Street, London, E.C.2.) 10″. Pp. 42. 7*s*. 6*d*.

[This provides a practical survey of the considerations involved in preparing forecasts of a firm's sales, output, capital expenditure, trading results and cash position. The purpose is to give a summary enumeration of as many as possible of the relevant factors, rather than to go deeply into the underlying principles. Much ground is covered in a small space. An appendix shows, by way of illustration, the relation between actual sales and forecast sales in the Metal Box Company for the years 1945–46 and 1956–57.]

JOHN (A. H.). A Liverpool Merchant House, being the history of Alfred Booth and Company, 1863–1958. London: Allen & Unwin, 1959. 9″. Pp. 197. 21*s*.

[Although Booth and Company's steamers to North Brazil undoubtedly bore no resemblance to Kipling's great steamers white and gold rolling weekly down to Rio, there is more in Latin America of interest to economic historians than is sometimes realised. It is good to see British businessmen operating in this area belatedly getting their share of the glory too often reserved for the great firms trading in the East. Alfred and Charles Booth began as leather merchants and New York agents for Holts' West Indian line. They were also prepared to turn their hand to other business. Thus, between 1864 and 1867, they acted for cotton brokers and cotton spinners. Nevertheless, until 1919, when Alfred Booth and Company acquired the United Construction Company from the Crittall Manufacturing Company, leather and steamships were to remain their principal interests. Having lost the Holt agency when the West Indian line was sold to the West Indian and Pacific Steamship Company, the Booths, in 1865, launched their own first steamer, the *Augustine*, trading between Liverpool and North Brazilian ports. In 1869 another Liverpool firm, R. Singlehurst and Company, entered this trade, and in 1870 Hugh Evans and Company's Maranham Steamship Company provided further competition. However, in 1871 the three Liverpool firms came to an agreement, and for thirty years thereafter had things more or less their own way. An attempted French invasion was defeated in the early 1880s, and a similar thrust by the Italians in the late 1890s was countered by the use of deferred rebates. Nevertheless, in 1902 the Hamburg–America Line succeeded in breaking the Liverpool monopoly, and the Liverpool firms had to come to an agreement with the new-comer. Booth and Company's interest in shipping led to allied activities, such as coal and cement merchanting, and to investment in harbour installations and warehouses. Similarly, their role of leather merchants led to investment in the manufacturing side of the leather industry. It is this multiplicity and flexibility of interests that is one of the most interesting aspects of the Company's history.]

KORTEWEG (S.) and KEESING (F. A. G.). A Textbook of Money. London: Longmans, 1960. 9″. Pp. xx + 308. 35*s*.

[To be reviewed.]

LEWIS (P. R.). The Literature of the Social Sciences. An introductory survey and guide. London: The Library Association (Chaucer House, Malet Place, W.C.1), 1960. 9″. Pp. xx + 222. 28*s*.

[This is an introduction to the bibliography of the social sciences, written up for the most part into a continuous text. About half of the book is concerned with economics and economic history, and the rest deals with politics, law, international affairs and sociology. It is intended for the use of librarians, the general reader and scholars seeking guidance outside their own subject. The treatment of economics is in general sound and well informed, though the amount of space given to older books in some places seems excessive for the type of reader for whom the guide is intended.]

MOULTON (H. G.). Can Inflation be Controlled? London: Allen & Unwin, 1960. 8″. Pp. xiv + 302. 21*s*.

[This book by the President-Emeritus of the Brookings Institution is concerned mainly with the causes of price-rises, and with possible cures only through the implications of the analysis of causes. It is written in a very clear style and moves smoothly to its conclusions. Dr. Moulton devotes a large part of the book to setting forth the grounds for rejecting any sort of monetary theory of inflation. While using only quite simple concepts and tools of analysis, he makes a convincing case. His positive conclusions are of the cost-push type. A fair part of the argument runs along familiar lines, and by concentrating his attack on purely monetary theories Dr. Moulton by-passes much of the recent controversy between the cost-push theory and more sophisticated versions of the demand-pull theory. However, much interesting historical detail is included, especially in connection with the inflation of the First World War and earlier years. A commendable feature of the book is its endeavour to view the problem of inflation all the time in a broad historical context and not simply as a problem of the last fifteen years.]

PRESSNELL (L. S.) (Ed.). Studies in the Industrial Revolution. Essays presented to T. S. Ashton. London: The Athlone Press, University of London, 1960. 9″. Pp. vii + 350. 42*s*.

[To be reviewed.]

ROBINSON (E. A. G.) (Ed.). The Economic Consequences of the Size of Nations. Proceedings of a conference held by the International Economic Association. London: Macmillan, 1960. 9″. Pp. xxii + 447. 50*s*.

[To be reviewed.]

ROSTOW (W. W.). The Stages of Economic Growth. A non-communist manifesto. London: Cambridge University Press, 1960. 9″. Pp. xi + 179. 21*s*.

[To be reviewed.]

STERN (W. M.). The Porters of London. London: Longmans, 1960. 9″. Pp. xvi + 346. 37*s*. 6*d*.

[To be reviewed.]

TAPLIN (W.). Advertising. A new approach. London: Hutchinson, 1960. 9″. Pp. 208. 25*s*.

[To be reviewed.]

VAIZEY (J.). The Brewing Industry, 1886–1951. An economic study for the Economic Research Council. London: Pitman, 1960. 9″. Pp. xxiv + 173. 30*s*.

[To be reviewed.]

WILK (L. A.). Accounting for Inflation. London: Sweet & Maxwell, 1960. 9″. Pp. xii + 184. 35*s*.

[This sets forth and explains in detail an accounting procedure which would achieve the central purpose of accounting, namely to present a " true and fair view " of the financial position of a concern, notwithstanding the effects of inflation. The underlying principle is that profit should be calculated after provision has been made for maintaining the general purchasing power of net assets. The author explains how the principle may be applied to fixed assets, to stocks and to liabilities (the need to make a proper allowance for the reduction in the real burden of liabilities fixed in money terms brought about by inflation is an important element in the argument). Attention is then given to a number of special issues, including the treatment of Preference Shares, and the complications arising in the case of holding companies and nationalised industries. In relation to the question of taxation, the author argues that the object of his proposals is to secure equity between businesses, and not to decide how the tax burden should be divided between businesses and other classes of taxpayers; if the effect of his proposals were to lessen the tax paid by businesses, this could be offset, if desired, by an appropriate alteration in rates of tax.]

WILLIAMS (H. T.) (Ed.). Principles for British Agricultural Policy. London: Oxford University Press for the Nuffield Foundation, 1960. 9″. Pp. xiii + 317. 18s.

[To be reviewed.]

New Zealand

New Zealand's Continuing Development. An introduction to the more important aspects of the New Zealand economy. Second edition. Wellington and London: Australia and New Zealand Bank, 1959. 9″. Pp. vi + 90.

[This is a popular illustrated introduction to the economic structure and prospects of New Zealand.]

Indian

BAJPAI (O. P.). Elements of Life Assurance. Allahabad: Kitab Mahal, 1959. 8½″. Pp. 195. Rs. 5.0.

[This is a text-book for Indian students describing the principles and types of life insurance.]

CHATURVEDI (J. N.). Theory of Marketing in Underdeveloped Countries. Allahabad: Kitab Mahal, 1959. 8½″. Pp. 135. Rs. 7.50.

[Despite its imposing title this slight, ill-produced work will be of little value to the serious student. The author pleads for a new approach to economic theory with the problems of underdeveloped areas in mind, but he fails to produce any consistent, logically argued new theory.]

Indian Economics Year Book 1959–60. Allahabad: Kitab Mahal, 1959. 7½″. Pp. v + 266. Rs. 3.0.

[This is the second edition of a book first published in 1957 and the publishers hope to produce further up-to-date editions in the future. It is a useful compilation of Indian economic statistics and potted facts about the plans, agriculture, industry and so on. Students would find it more valuable if the sources of the figures were indicated. The main defect is that the authors seem undecided as to whether to produce a " crammer " for elementary students, with, for example, a list of the reasons for India's nineteenth-century industrial backwardness, or whether to provide simply a work of reference for those who want only the bare facts.]

MUKHERJEE (P. K.) and KANUNGO (K.). Food Administration in Punjab and U.P., 1946–53. An analysis of price control, procurement and distribution of food grains. Delhi: Agricultural Economics Research Section, Delhi School of Economics, 1959. 9½″. Pp. v + 128. Rs. 5.0.

[This books shows why there has been so much criticism of food administration in India. Controls in the Punjab were evidently more successful than those in Uttar Pradesh, but in both regions smuggling, black markets, bad storage arrangements and inefficient administration were evident. Despite so many serious defects the authors believe that " we cannot afford to leave food prices to the hazards of a market economy."]

NAGPAL (B. D.). Illustrated Income-tax Law. Allahabad: Kitab Mahal, 1959. 9″. Pp. 380. Rs. 7.50.

[This is an elementary text-book for students in accountancy and commerce. Each chapter contains test questions and answers.]

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH. Some Aspects of Goods Transport by Road in the Delhi Region. Bombay: Asia Publishing House, 1958. 9″. Pp. 59. Rs. 3.50.

[This is the second of the Council's Occasional Papers and it deals with a subject on which, in contrast to the railways, little has been written. Information is provided on costs, organisation, the problem of co-ordination with other forms of transport and the effect of government restrictions on the movement of goods by road. The authors recommend a modification of these restrictions and the establishment of an inter-state transport commission.]

PAL (B. N.). Principles of Agricultural Economics. Allahabad: Kitab Mahal, 1959. 8½″. Pp. 751. Rs. 18.0.

[The aim of this long work is to give an elementary introduction to the subject for students and laymen. The matter is not new and the exposition at times, for example on rent, lacks clarity. There is no index.]

RAMADADHAM (V. V.). **The Economy of Andhra Pradesh.** Bombay: Asia Publishing House, 1959. 8½". Pp. ix + 302.

[This regional study of the "linguistic" state created in 1953 from parts of Hyderabad and Mysore provides a great deal of useful information on agriculture, private and public industries, urbanisation, trade and transport. It is profusely illustrated with official statistics. The author admits their dubiety and gives examples of contradictions in official publications. He attempts an estimate of total and sectoral incomes, but this is certainly subject to a wide margin of error. The book is descriptive rather than analytical, and some will doubt the author's concluding statement that "the greatest need of Andhra Pradesh is to devise an appropriate mechanism whereby financial and managerial resources flow into the state from outside."]

RAO (B. S.). **Surveys of Indian Industries.** In two volumes. Volume I: 1957, Pp. 358, 27*s.* 6*d.*; Volume II: 1958, Pp. 320, 35*s.* Bombay and London: Oxford University Press. 10".

[These two volumes contain a brief description of 24 major industries in India, ranging from cotton and iron and steel to ceramics and the film industry. Each account has a short historical section, but the main evidence is from the post-war period. The field covered is too wide to enable other than superficial treatment. As an introductory survey on the lines of G. C. Allen's *British Industries and their Organisation* the book will be useful.]

SOCIETY FOR SOCIAL AND ECONOMIC STUDIES. **Capital for Medium and Small-scale Industries.** Bombay: Asia Publishing House, 1959. 8½". Pp. vii + 144.

[This is the first publication of a new society modelled on the British P.E.P. In this short study the authors provide a brief survey of the growth, organisation, capital requirements and sources of finance of the medium and small industries. excluding the village or cottage industries. The government under the plans has set up a number of institutions to facilitate the financing of these industries, but many of them still rely on loans from money-lenders at high rates of interest. The authors recommend a closer link between the banks and the small industries and more government assistance. They pay insufficient attention to the cost of such State support and scarcely discuss the reasons for subsidising apparently uneconomic small industries.]

TRIPATHY (R. N.). **Fiscal Policy and Economic Development in India.** Calcutta: The World Press, 1958. 8½". Pp. viii + 318. Rs. 15.0.

[The aim of this well-produced, well-written book is to assess how far Indian fiscal policy is conducive to economic growth. The book is the published form of a successful London Ph.D. dissertation. The author first analyses some of the main problems hindering economic growth in India and concludes that the nature of these makes government planning essential. The bulk of this study is concerned with describing and criticising the methods used to finance the plans. In particular, the author is critical of the federal structure of public finance. He recommends, for example, that the agricultural income tax, at present levied at different rates in different states, should be centralised and made uniform. He argues that deficit financing in the second plan led to inflationary pressure which adversely affected savings and warns of the dangers likely to result from further large-scale deficit financing. The policy of prohibition in certain states is regarded by him as an expensive failure. There is a great deal of interesting information and some penetrating discussion in this book.]

VENKATASUBBIAH (H.). **Indian Economy since Independence.** Bombay: India Publishing House, 1958. 9". Pp. ix + 343. 30*s.*

[This is not a detailed economic history based on original research but a narrative of some selected aspects of Indian development in the decade after 1947. The main subjects discussed are the political framework, the land question, public and private enterprise, foreign trade, public finance and planning. The chapter on foreign trade is the most interesting and useful, but the economic analysis generally is not very penetrating. The book will provide a readable introduction to the layman wishing to know something about the Indian economy.]

American

BOYLE (G. J.). **Use of Service Charges in Local Government.** A monograph on the prevalence and value of nontax revenue. New York: National Industrial Conference Board, 1960. 9". Pp. 56.

[Charges levied for the use of particular local-government services have been the most rapidly expanding source of income for local authorities in the United States in recent years. This informative pamphlet presents some of the leading statistics and considers the general issues involved. Data are given for different cities of the revenue received from different classes of charges, and a comparison is made of the tax and debt positions of cities that make much or little use of charges.

A study of incidence of service charges in two representative cases suggests that they are markedly more regressive than tax financing, and it is suggested that this is probably the reason why their use so far has been mainly confined to services that have a fairly low cost.]

BULLOCK (H.). The Story of Investment Companies. New York: Columbia University Press, 1959 (London: Oxford University Press, 1960). 9½". Pp. xii + 305. 48*s*.

[The nineteenth-century business and financial world produced a number of men, who, lacking any scholarly pretensions, understood that their work was part of something important and were impelled to write about it. Mr. Bullock is in this tradition. In a disarming preface he protests that his book is neither an exposition nor a treatise but a story. The story begins with a brief treatment of English and Scottish investment companies of the 1870s; continues with a chapter on early American trusts and another on American trusts of the 1920s; and goes into top gear with a discussion of the demoralised 1930s, when revulsion against investment companies in the United States was so strong that, according to the Securities and Exchange Commission, " aggregate market values of shares in investment companies . . . was approximately 35% less than the actual value of the assets of these companies " (p. 47). Subsequent chapters bring the story down to the immediate past in the United States, in Canada and in Great Britain. Besides 179 pages of text, this book includes a glossary, a bibliography, an appendix listing companies according to several classifications and, finally, excerpts from the annual reports of four investment companies. Nevertheless, at forty-eight shillings, it seems over-priced.]

The Business Outlook 1960. A discussion by the National Industrial Conference Board Economic Forum and Guests. Studies in Business Economics No. 67. New York: National Industrial Conference Board, 1959. 9". Pp. 106.

[This symposium follows the lines established in previous years. Each participant is given an opportunity to make one major contribution, and it and the interruptions and discussion are given verbatim. The contributions vary in quality, but most of them contain points of interest. Valuable insights into what are substantially the same topics can, in the present state of economics, be given both by such highly informal, though well-prepared, discussions as the present one and by econometric studies of a kind most unsuited for oral presentation; it may be debated whether this is a sign of the many-sidedness of economics or merely of its immaturity as a science.]

CAVES (R. E.) and HOLTON (R. H.). The Canadian Economy. Prospect and retrospect. Cambridge, Mass.: Harvard University Press, 1959 (London: Oxford University Press, 1960). 8½". Pp. xxii + 676. 80*s*.

[To be reviewed.]

CAVIN (J. P.) (Ed.). Economics for Agriculture. Selected writings of John D. Black. Cambridge, Mass.: Harvard University Press, 1959 (London: Oxford University Press, 1960). 8½". Pp. xi + 719. 96*s*.

[This contains twenty-four extracts from the writings of Professor J. D. Black on agricultural economics, classified according to subject. Each section is introduced by an essay by a former student of Professor Black's, who surveys the subject concerned and Professor Black's contribution to it. The volume is opened by a portrait of Professor Black, written by Professor J. K. Galbraith.]

COALE (A. J.) and HOOVER (E. M.). Population Growth and Economic Development in Low-income Countries. A case study of India's prospects. Princeton, New York: Princeton University Press (London: Oxford University Press), 1959. 10". Pp. xii + 389. 42*s*.

[This is another important work from the Office of Population Research at Princeton University, an institute already well known for its excellent demographic studies of Japan and India by Taeuber and Davis. The work of Davis was largely historical, sociological and statistical. This book is more concerned with economic problems and projections. There are five parts. The first contains a brief discussion of the general relations between population growth and economic development. In Part II there is a description of the present size and composition of Indian population. In addition, the trend of population until 1986 is projected under various assumptions of fertility and mortality changes. The longest section is Part III entitled " Factors in Indian Economic Development." The obstacles to progress in the main sectors of the economy are analysed, the development policy of the government is discussed and inspired guesses are hazarded at the likely future course of economic development. For example, the authors see little hope of great increases in agricultural output *per capita*. Part IV considers the prospects of Indian economic development in the future under different courses of fertility and concludes, not surprisingly, that lower fertility would enable a more rapid growth of both aggregate and *per capita* output. In Part V the conclusions reached in the Indian case are applied to Mexico and a similar general result is obtained—namely that there are substantial economic advantages in reducing fertility. This study makes a significant contribution to our knowledge of one of the most vital problems facing the world to-day. It provides more potent ammunition for those who believe that a fall in fertility is essential for economic development in most low-income countries.]

DEBREU (G.). Theory of Value. An axiomatic analysis of economic equilibrium. Cowles Foundation Monograph No. 17. New York: John Wiley, 1959 (London: Chapman & Hall, 1960). 9½". Pp. xii + 114. 38*s*.

[To be reviewed.]

Economics and the Policy Maker. Brookings Lectures, 1958–1959. Washington, D.C.: The Brookings Institution, 1959 (London: Faber, 1960). 8½". Pp. xiii + 209. 21*s*.

[This contains eight lectures, as follows: "Economics and Business Planning," by Sidney S. Alexander; "Economic Stabilisation Policy," by Gerhard Colm; "The Problem of Creeping Inflation," by Neil H. Jacoby; "Taxation Policy," by Louis Shere; "Monetary and Credit Policy," by Robert V. Roosa; "Economics and Collective Bargaining," by Sumner H. Slichter; "Competition and Monopoly," by Mark S. Massel; and "Economics and Economic Development," by Everett D. Hagen. The series was designed to review the uses of economics in private and public affairs. As it turns out, several of the contributors took the opportunity for a general discussion of the aspects of public policy in which they were specially interested, so that their contributions, though of value in themselves, did not cast a great deal of light on the specific question of the role of economics and the economist. The contributors who paid attention to this aspect were Alexander, Shere, Massel and Hagen. Especially notable is Alexander's lively and stimulating discussion of the usefulness of the economist as a consultant to private business.]

EDWARDS (C. D.). The Price Discrimination Law. A review of experience. New York: The Brookings Institution, 1959 (London: Faber & Faber, 1960). 9½". Pp. xxii + 698. 72*s*.

[To be reviewed.]

EZEKIEL (M.) and FOX (K. A.). Methods of Correlation and Regression Analysis: linear and curvilinear. Third edition. New York: John Wiley (London: Chapman & Hall), 1959. 9½". Pp. xv + 548. 88*s*.

[Professor Ezekiel's standard text-book first appeared in 1933, and no new edition has appeared for a good many years. He has now, with a new collaborator, brought out a substantially revised edition, which takes account of recent developments in the subject while leaving unaltered the book's general lay-out and character. The chief innovations are the addition of a chapter on simultaneous equation solutions and a revision of the treatment of error formulæ for time series. Account is also taken of the new methods of computation now available.]

FERBER (R.). Collecting Financial Data by Consumer Panel Techniques. A pilot study. Studies in Consumer Savings, No. 1. Urbana, Illinois: Bureau of Economic and Business Research, University of Illinois, 1959. 9½". Pp. x + 177. $2.50.

[The survey technique discussed in this volume is that of collecting data about expenditure and saving from the same families over a period of time. This panel technique is capable of yielding information of a type not available from ordinary surveys, but it is also subject to certain special difficulties of a practical kind, notably that of persuading the participants to go on co-operating. Professor Ferber describes the procedures adopted in a pilot panel inquiry conducted in Chicago in 1956 and the methodological lessons learnt from the experiment.]

GREBLER (L.). Housing Issues in Economic Stabilization Policy. National Bureau of Economic Research Occasional Paper 72. New York: National Bureau of Economic Research, 1960. 9". Pp. xi + 129. $1.50.

[This is a detailed study of the effects of United States government policies towards housing credit during the period 1953–57, viewed in relation to the general problem of economic stabilisation. During this period residential construction experienced one complete short cycle, of moderate amplitude, with a peak in 1955 and a recession in 1958. Dr. Grebler finds that building has shown fair responsiveness to official credit policy, though things have not always worked out quite as intended. This has been partly because of lags, and partly because of the unforeseen effects of the upper limit on interest rates payable on government-guaranteed mortgages, which caused the supply of mortgage finance to diminish when the general level of interest rates rose.]

GURLEY (J. G.) and SHAW (E. S.). Money in a Theory of Finance. Washington, D.C.: The Brookings Institution (London: Faber), 1960. 9½". Pp. xiv + 371. $5.00.

[To be reviewed.]

HARTMANN (H.). Authority and Organization in German Management. Princeton New Jersey: Princeton University Press, 1959 (London: Oxford University Press, 1960). 9″. Pp. xvi + 318. 48*s*.

[This interesting study is not concerned primarily with the details of German managerial practice, still less with its efficiency for productive purposes, but rather with the social relationships involved and the underlying ideologies. Its central theme is that the German conception of management is not a functional one but is based on certain ultimate values, especially the sanctity of private property and the rights and duties associated with its ownership. The traditional German notion of the quasi-divine right of the *Unternehmer* has survived to a remarkable extent the disruptions involved by Nazism and the allied occupation, and has pervasive effects on management practice. Among the more particular topics considered by the author are the relationship between owners and salaried managers and between them and workers and trade unions, the recruitment of management, and associations of business leaders. In stressing the survival of traditional values the author is anxious none the less not to underrate the changes that have occurred since the War and may be carried further in the future. Especially important in this context is the effect of contacts with American firms and the challenge presented by the American functional approach to management.]

HIGGINS (B.). Economic Development. Principles, problems and policies. New York: Norton, 1959 (London: Constable, 1960). 9″. Pp. xviii + 803. 60*s*.

[To be reviewed.]

JUSTER (F. T.). Consumer Expectations, Plans, and Purchases: a Progress Report. National Bureau of Economic Research Occasional Paper 70. New York: National Bureau of Economic Research, 1959. 9″. Pp. xviii + 171. $2.50.

[In this survey study consumers' stated buying plans for the future are compared with (*a*) their family financial circumstances, their expectations and their attitudes, and (*b*) their subsequent actual purchases. The findings are used to assess the reliability of buying plans as a forecasting tool.]

KNEESE (A. V.). Water Resources. Development and use. Kansas City, Missouri: Federal Reserve Bank of Kansas City, 1959. 9″. Pp. xii + 68.

[This is a lucid general introduction to the economics of water resources. It deals both with the factual outlines of the problem as it exists in the United States and with the issues of economic theory involved in deciding how much should be spent on water-development programmes and how alternative programmes should be evaluated.]

LAMPMAN (R. J.). Changes in the Share of Wealth Held by Top Wealth-holders, 1922–1956. National Bureau of Economic Research Occasional Paper No. 71. New York: National Bureau of Economic Research, 1960. 9″. Pp. 32. 75c.

[This is reprinted from *The Review of Economics and Statistics* for November 1959. It contains the first attempt that has been made to relate the information on wealth-ownership in the United States derived from estate-tax data (limited to estates above $60,000) to Goldsmith's national balance-sheet aggregates.]

MACAULAY (H. H.). Fringe Benefits and Their Federal Tax Treatment. New York: Columbia University Press, 1959 (London: Oxford University Press, 1960). 9½″. Pp. x + 246. 52*s*.

[In recent years the value of fringe benefits has risen considerably faster in the United States than the wage-bill has. Tax preference has not been the only reason for this—wage-stabilisation policies have also contributed—but it has probably been the chief one. Dr. Macaulay attempts to deal with the problems involved on the basis of a consistent definition of income, though he recognises that no sharp line can be drawn between income, which ought to be taxed, and conditions of employment, which it is certainly not feasible to make a subject of taxation, whatever might be desirable in theory. Having laid down his general principles, he considers the appropriate ways of treating each of the main classes of fringe benefit. This is a useful and well-thought-out survey of an increasingly important topic.]

MASON (E. S.) (Ed.). The Corporation in Modern Society. Cambridge, Mass.: Harvard University Press, 1959 (London: Oxford University Press, 1960). 9½″. Pp. xv + 335. 54*s*.

[To be reviewed.]

MEYER (A. J.). Middle Eastern Capitalism. Nine essays. Harvard Middle Eastern Studies, 2. Cambridge, Mass.: Harvard University Press, 1959 (London: Oxford University Press, 1960). 8½″. Pp. viii + 161. 30*s*.

[This informative and lively book is addressed to the general reader, but the author's wide knowledge of the area and his sensible approach to its problems provide much of interest to the student of economic development. Formal economic analysis is deliberately avoided, but Mr. Meyer is well acquainted with the recent theoretical and empirical literature. His attitude is an independent one, and his realistic views on such matters as the respective roles of government and private entrepreneurs in the economic development of the region will be uncongenial to extremists of either persuasion.]

NORDSKOG (J. E.). Social Change. New York and London: McGraw-Hill, 1960. 9½″. Pp. vii + 423. 58*s*.

[To be reviewed.]

NOVE (A.). Communist Economic Strategy: Soviet Growth and Capabilities. Washington: National Planning Association, 1959 (London: Oxford University Press, 1960). 9″. Pp. xi + 82. 18*s*.

[This provides a useful and interesting introduction in both statistical and qualitative terms to the study of the Soviet economy and its growth prospects. It includes a discussion of labour and capital resources, techniques of planning, social and political pressures, and of achievements to date. The context of the discussion is the prospective comparative performance of the Soviet bloc and the Western world, but this competitive approach to the problems of economic growth is not unduly obtrusive.]

Progress against Inflation. A series of talks delivered to sessions of the National Industrial Conference Board in 1959. New York: National Industrial Conference Board, 1960. 9″. Pp. 67.

[This contains a group of six addresses on different aspects of the problem of inflation, delivered at a meeting of the National Industrial Conference Board in November 1959. The contributors are economists in academic life and in the public service.]

RAPKIN (C.) and GRIGSBY (W. G.). Residential Renewal in the Urban Core. Philadelphia, Pennsylvania: University of Pennsylvania Press (London: Oxford University Press), 1960. 8½″. Pp. 131. 30*s*.

[This is a detailed study of the potential demand for residential accommodation in a run-down central area in Philadelphia. Its object is to cast light on the prospects of carrying out a successful renewal programme. The conclusion is that there is a fair prospect of rising demand from certain types of family but not much prospect of attracting families with children. For this reason there is adequate scope for residential use of the central core itself, but probably not for residential redevelopment of all the surrounding slum area.]

SANNWALD (R.) and STOHLER (J.). Economic Integration. Theoretical assumptions and consequences of European unification. Translated by H. F. KARREMAN. Princeton, New Jersey: Princeton University Press, 1959 (London: Oxford University Press, 1960). 9″. Pp. xvi + 260. 40*s*.

[To be reviewed.]

THURSTON (P. H.). Systems and Procedures Responsibility. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey & Swinfen), 1959. 8″. Pp. x + 110. 20*s*.

[The subject of this monograph, which is based on a number of case-studies, is how responsibility for planning and installing improved systems of working should be divided between specialists in this kind of work and those who are permanently engaged in the part of the organisation where the improvement is being introduced and will have to operate it when it has been installed. It is argued that both have an important part to play, but the author suggests that ultimate responsibility for leadership in systems work should rest with the operating manager rather than with the systems specialist. In discussing the various difficulties involved in this kind of work the author emphasises the importance of having a trial period for new procedures.]

WARTON (C. R.). The U.S. Graduate Training of Asian Agricultural Economists. New York: The Council on Economic and Cultural Affairs (630 Fifth Avenue, New York), 1959. 9″. Pp. 57.

[This study is based on an extensive series of interviews with Asian students and graduates and their teachers in American universities. Although it is specifically concerned with agricultural

economics, many of the problems discussed will be familiar to British university teachers who handle Asian undergraduates and research students, and some of the author's suggestions for dealing with these problems have general interest.]

WHITTAKER (E.). Schools and Streams of Economic Thought. Chicago, Illinois: Rand McNally (London: John Murray), 1960. 9½". Pp. xvi + 416. $6.50.

[This incorporates some of the material contained in the author's *History of Economic Ideas*, published in 1940, but the treatment is briefer and the approach somewhat changed. The arrangement is chronological, starting from the earliest times and coming commendably up to date. So many authors and topics are touched on that the pace has to be that of a gallop, but Professor Whittaker is on the whole successful in putting across the important points and placing them in their context of contemporary economic thought.]

Dutch

GOLDBERGER (A. S.). Impact Multipliers and Dynamic Properties of the Klein–Goldberger Model. Contributions to Economic Analysis, XIX. Amsterdam: North-Holland Publishing Company, 1959. 9". Pp. 138. 30*s*.

[This is a further analysis of the properties of the well-known Klein–Goldberger econometric model of the United States economy. It is based largely on the so-called reduced form of this model, in which variables are expressed as functions of exogenous factors only. Use of the reduced form makes it possible to assess the combined consequences of both direct and indirect effects of a given change. In this way the full multiplier effects of exogenous changes are shown. The technique is used, as well, to investigate the most important determinants of economic change during 1929–52, as revealed by the model, and to trace out the dynamic properties of the model. This discussion includes a useful account of the mathematical procedure for analysing the properties of a system of difference equations. A difficulty which emerges at several points is that the real and the monetary aspects of the model turn out to be rather unsatisfactorily related.]

QAYUM (A.). Theory and Policy of Accounting Prices. Contributions to Economic Analysis, XX. Amsterdam: North-Holland Publishing Company, 1960. 9". Pp. 123. 26*s*. 6*d*.

[To be reviewed.]

THORBECKE (E.). The Tendency towards Regionalization in International Trade, 1928–1956. The Hague: Martinus Nijhoff, 1960. 9½". Pp. xiii + 223.

[To be reviewed.]

Finnish

VAIVIO (F. L.). Liikepankin Likviditeettiongelma koko Pankkijärjestelmää Silmälläpitäen (The liquidity problem of the commercial bank with regard to the whole banking system). Jakaja: Liiketaloustieteellinen Tutkimuslaitos, 1960. 9½". Pp. 252.

[The author takes as his starting-point a broad definition of liquidity as capacity to pay expected and possible obligations arising within a future period. The application of this principle is stated in balance-sheet terms. In order to consider the liquidity problems of banks, as opposed to other businesses, preliminary discussion is needed of what a bank is and what is the theory underlying its operations. The author therefore sets out a model of the working of a bank, though he feels that more study is still needed on this question. He is then enabled to consider the logical basis of the liquidity rules adopted by commercial banks or imposed on them by central banks.]

Greek

CHOUMANIDIS (L. T.). The Theory of Wages, from the time of the classics to this date. Athens: Makropodara, 1957. 9½". Pp. 160.

[This is a painstaking historical survey of wage theory, and covers a wide range of literature, including empirical and sociological studies as well as the literature of economic theory. Most of the book is devoted to summary and criticism of the views of others. In a brief statement of his own views the author emphasises, amongst other things, the disutility of subordinate status as part of the costs for which the worker has to be compensated. The book is in Greek, but a duplicated English translation is available.]

Israel

The Falk Project for Economic Research in Israel. Fourth Report 1957 and 1958. Jerusalem: Falk Project for Economic Research (75 King George Avenue), 1959. 9¼″. Pp. 198.

[A long essay by Professor Patinkin on the development of Israel's economy during its first decade occupies the greater part of this report. This essay is in macro-economic terms, with practically no discussion of individual industries or their problems. The topics dealt with are, in order, population and labour supply, the growth of national product and income, capital accumulation and inflation. Much interesting analytical material is included on such subjects as absorption of immigrants; the relative contributions to the growth of output made by increases in labour input, capital input and technical improvements; the finance of investment; the balance of payments; and the movements of wage-rates. Professor Patinkin argues that the economy's success in absorbing immigrants and increasing output must be set against its failure to eliminate its dependence on foreign assistance, as reflected in its continuing enormous import surplus. He believes that the reduction of this surplus is essential, both because the sources from which it has been financed are likely to decline and because the reliance on foreign borrowing is already creating a serious burden of interest payments. He regards the import surplus as largely the consequence of excessive domestic expenditure, especially rises in consumption, and as the external manifestation of the inflation shown internally by the rise in the price-level. He believes that retrenchment is needed both in consumption and in investment, and he also favours increased use of the price-mechanism to induce a structural reorientation towards the production of exports and import-substitutes. In the chapter on the inflationary process much space is given to data on money and the velocity of circulation. But the author then goes on to admit that these really prove nothing as to cause. His conclusion (p. 125), that the persistence of an import surplus proves that inflation has in the last analysis been due to excess demand, seems to imply the debatable proposition that import surpluses are always necessarily due to excess demand.]

Official

Jamaican

Report of the Commission of Enquiry on the Sugar Industry of Jamaica. Kingston: The Government Printer, 1960. 10″. Pp. 93.

[The occasion of the appointment of this Commission was the strike that took place in the Jamaican sugar industry in 1958. The first of the Commission's terms of reference was to consider the causes of the strike, and although their report covers wider ground, including an extensive treatment of the industry's financial results between 1954 and 1958, it is mainly oriented towards the question of labour relations and the industry's capacity to pay wages. It includes much interesting material, presented concisely and clearly. The strike occurred because a sharp decline in profits in 1958 caused employers to refuse to pay the crop bonus which had been customary in previous years. The fall in profits was partly due to a fall in the price fetched by the part of Jamaican sugar output not sold within the Negotiated Price Quota and partly to unfavourable natural conditions. The Commission believes that the poor financial results of 1958–59 are unlikely to continue, and it concludes that, having regard to this and to the high profits earned in previous years, an increase in wages is justifiable. It also finds that the financial estimates used by the employers in the course of wage negotiations contained serious errors due to double counting. These errors in calculation had persisted for a number of years, and were unknown both to employers and to workers' representatives until the estimates were examined by an outside expert shortly before the beginning of the Commission's hearings.]

International

International Monetary Fund. Summary Proceedings of the Fourteenth Annual Meeting of the Board of Governors, September 1959. Washington, D.C.: International Monetary Fund, 1959. 9″. Pp. 181.

[These proceedings include an address by Dr. Jacobsson and statements by Governors for the member countries. Dr. Jacobsson's address surveys developments during the year and discusses, amongst other things, the movement towards convertibility, the increase in the Fund's resources, the part it has played in the stabilisation policies adopted by certain countries and certain more general issues concerning commodity prices and the importance of monetary discipline.]

United Nations. Economic Survey of Africa since 1950. New York: United Nations, 1959. 11″. Pp. 248. 21*s*.

[This is primarily a descriptive work, and a large proportion of its space is occupied by tables of statistics drawn from a variety of sources and presented, as far as possible, in comparable form for

the different countries. Additional material and background discussion is provided in the accompanying text. It constitutes a convenient and compendious work of reference without in itself providing (or seeking to provide) any startingly new insights. Its four chapters deal in turn with structure, growth trends, external trade and capital formation.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Agricultural Credit in Economically Under-developed Countries, by H. BELSHAW. Rome: F.A.O., 1960. 9″. Pp. 255. 15*s*.

[This is a general survey arranged on analytical rather than descriptive lines. In Part I Dr. Belshaw considers the relation between agricultural credit and the problem of economic development as a whole and then goes on to review the conditions affecting the supply and demand for agricultural credit. Part II is devoted to questions of policy. It discusses ways of increasing the supply of funds, the conditions attached to loans and the parts that may be played by various organisations, including the government, the banks and co-operatives. Agricultural credit in backward countries is a subject that had already been extensively studied and written about before the great recent growth of interest in problems of these countries, and Dr. Belshaw is at pains to discuss it in relation to modern ideas regarding economic development as a whole. He emphasises the importance of bringing about changes in the attitudes and institutions that affect methods of agricultural production if improvements in the supply of credit are to produce any lasting benefit.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Yearbook of Fishery Statistics, Vol. IX, 1958. Production and fishing craft. Rome: F.A.O., 1959. 12″.

[This contains internationally comparable statistics for the years 1953–58, relating to catch and landings by quantities and values, production of preserved and processed fishery commodities, and fishing craft. A separate section deals with whaling statistics.]

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Volume 122, SERIES A (GENERAL) **CONTENTS** **Parts 3 and 4, 1959**

Part 3

The Comparison of Survival Curves (With Discussion) . . . . . P. ARMITAGE
ERNIE—A Mathematical and Statistical Analysis (With Discussion) . . . W. E. THOMSON
Private Motoring and the Demand for Petrol . . . . . J. S. CRAMER
A Survey of Fellows—II . . . . . KATHLEEN GALES
A note on the Paper by D. D. Kosambi and U. V. Ramamohana Rao on "The Efficiency of Randomization by Card Shuffling" . . . . . A. W. JOSEPH
Wholesale Prices in 1938 . . . . . THE EDITOR OF THE STATIST

Part 4

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Contents

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ALAN W. BROWN and HENRY A. LANDSBERGER
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